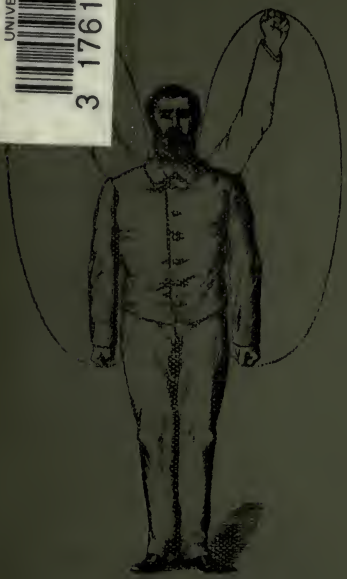
MEDICAL INDOOR GYMNASTICS



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Medical Indoor Gymnastics

OR

A SYSTEM OF HYGIENIC EXERCISES FOR HOME USE

TO BE PRACTISED ANYWHERE WITHOUT APPARATUS OR ASSISTANCE BY YOUNG AND OLD OF EITHER SEX FOR THE PRESERVATION OF HEALTH AND GENERAL ACTIVITY

BY

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Medical Indoor Gymnastics

It is a surer method, more fruitful of results, and more worthy of a man, to develop and to *earn* Health as far as possible by personal activity, than when it is lost to *look passively* to nature, or to drugs to bring about its slow return.

Preface to the First Edition.

In life we often pass by or underestimate what is simple, natural, and near at hand, preferring to believe that our welfare is to be found in something far away. This is often the case in our methods of obtaining health. Providence has endowed our organism with the germs of countless powers and capabilities, whose natural development, and use we should always be endeavouring to promote by our actions. If we develop them fully we shall then be able to make the best use of them; but if we fail in the first, our health, our happiness, our powers and mental capabilities, will be undermined by the loss we shall sustain.

The endeavor to harmonize the powers that lie within our organism, both with each other and with regard to outside circumstances, by careful and thoughtful use, and with as little aid as may be derived from heterogeneous, so-called medicinal substances, in a word, that we are looking to the positive, and simple, and natural for help, — this is the important advance, the triumph, of the healing art of our times. She has thrown aside the rubbish which past centuries, in their insufficient knowledge of nature, and crude empiricism, had heaped confusedly about her.

For even those capabilities for movement which lie in our bodies, and only need our will to bring them into use, can by their right development and usage both protect our constitution from manifold evils, and give important aid towards allaying those disorders which may have already made their appearance. The health-bringing results of this method, which is always ready at hand for everyone to make trial of, need only a clearer knowledge of the How

and Where to carry it out, for it to become of permanent benefit to our race.

The means of attaining this should be the business of the physician, and is the object of this work. For in bringing forward this method we offer no specific or secret operations, no artificially constructed system, but are following honestly the paths of nature, which can restore the invalid to health by the same method and means by which the healthy body is developed and preserved. The movements indicated are absolutely natural, as they are grounded on the mechanism of the human body, and sugggested by the conformation of its joints. For this reason we recommend this method, both for the normal development and maintenance of health, and for healing special maladies. And it is the cheapest and most practicable of any, for our own bodies are the only instruments used.

The importance of an all-round, carefully planned system of exercises, which shall be from every point of view safe, always practicable, and suited to all circumstances, must be generally recognised, although its full value will perhaps be only realised by future generations. It is the most natural method for bringing the constantly rising tide of culture in each rank of society into harmonious coöperation with the physical laws which govern our human organism. It completes and perfects the whole development of the body, preserves it from countless defects and disorders, while laying the necessary foundation for the development of the mind. Our exercises comprehend all the muscles of the body, and are arranged in a system of simple gymnastics of action, which from their origin are called the German system, to distinguish them from the Swedish, which consists principally in movements of resistance, which can only be carried out with the help of skilled gymnasts or complicated apparatus. I must apologise for the somewhat outspoken

manner of my explanations in various places. It was caused by the purely practical nature of this work, in which regard for the most absolute clearness to those who are quite inexperienced in these questions must be before everything else. If it be found of use to them, it will best fulfil the sincere wish of

THE AUTHOR.

The Contents.

I.

The Value of Medical Gymnastics in General.

Shall the mind be strong
The Body must lend it the strength.

Man is a twofold being, and consists of a marvellously intimate union of two natures, mental and physical; and he should keep both of these in activity, in order to use to the fullest both his mental and his physical powers. His whole being is constituted for this end. Those who are dull in mind, or lazy in body, long vainly for the enjoyment of mental and physical happiness; for the real sweets of life are the reward of industry alone. The want of this brings on dullness of the whole organism, disturbance of its action, then disease, and early death. For just as all the powers by means of suitable use are increased and kept at a certain high grade, so on the contrary, are they stunted and wasted by want of use, long before the proper time.

These are truths which everyone recognises, but which however are being constantly ignored. Many use their whole strength in a one-sided fashion, *in mental activity only*, while they forget the demands of their physical side — a fault which of course is connected, although not quite necessarily, with the conditions of civilisation, and the refinements of our modern life. Others only desire to enjoy, without in any way earning, this enjoyment through the use of their bodily powers. But Nature will be obeyed; she punishes those who oppose her, and often very sharply; and our physical nature especially visits most severely any disobedience to its commands.

And so it happens that neglect to cultivate our bodily powers, and neglect to use all the powers of a well-formed body, has brought, and always will bring, countless ills upon our race. For by these means alone, can the organic changes and renewals, which are the foundation of the whole chemical process of life, be kept in working order.

In full recognition of this, the physicians in all times have prescribed suitable physical exercises as the indispensable condition for the preservation, and where necessary for the renovation, of health. Those whose business compels them to physical inaction, were advised to practise now this now that, kind of exercise; whether walking, or longer tours on foot, riding, fencing, gardening, or any other vigorous bodily exercise. All these activities are, it is true, generally to be recommended, so far as they are possible; but yet they are partly too one-sided, partly — and this is the most important reason — almost impossible except for the very few, and then not for any length of time; so that we cannot look upon them as a sufficient compensation for what is needed. In almost every case, therefore, people were compelled to resign themselves to regular walks as the only methodical exercise which they could maintain for any considerable time.

It was felt, however, that this exercise was far too one-sided and insufficient, especially for the whole of the active middle life, if we were to take into consideration the real needs of the body.* And even this poor resource of walking

* If we would realise clearly how very insufficient is the usual constitutional walk taken by those who cannot otherwise get sufficient exercise, we may compare it with the amount of daily exercise which even not very robust persons can endure for several weeks at a time when climbing in the Alps, although they do not attempt more than four to six hours of hill-climbing daily, or with the moderate exertions of a gardener, both of which amounts of exercise, while they are from every point of view beneficial, can be easily shown to be not more than is needed, and by no means excessive. But what a difference between the constitutional walk and these! When anyone, as thousands are constantly doing, only makes use of

exercise was becoming every day less practicable for in consequence of the raising of the intellectual level in the different professions, the demands upon mental cultivation and activity were constantly increasing, and claimed so much time, attention, and concentrated effort, that most people wanted not only the inclination, but even the time, to combine with the demands of their day's work a walk of several hours without any special aim. The disproportion between the demands of the mental life, and professional claims on the one hand, and the needs of our physical nature on the other, became constantly more marked, and fraught with worse consequences for, a large portion of the community.

It was felt, therefore, that to bridge over this difficulty some special method must be prepared. The higher development of mental cultivation both in the present and in the rising generations demands, as the first condition of its successful advance, an altogether higher and more harmonious degree of physical culture ; because, if the mental plant-life is to bear strong and beautiful flowers and fruit, this can only occur when the roots are equally well developed. Just as the more highly developed man, when compared with primeval men, can no more confine himself to, nor rely that he will receive food and drink directly and without industry from, the gifts of nature ; so, on the other hand, he can no longer leave his other physical needs merely to the course of his daily life, but must carefully consider what they are, and then by individual thought and action, win them from nature in accordance with her laws, and arrange his daily life with this end in view. In other words, he must exchange

his muscles for walking, he is like a farmer, who, while he owns five fields, only cultivates one of them, and leaves the other four to lie fallow and be choked with weeds and tares. We leave unexercised the muscles of the arms, chest, stomach, and back, whose use is so necessary for the most important functions of our organism. We shall return to this later on.

the unconscious and uncultivated for the conscious and cultivated. The higher we raise our lives above the rough and unconscious condition of nature, the more must our mental faculties, as we arrive at higher and freer planes, each in his own calling, be subordinate for the fundamental conditions of their existence to scientific knowledge and calculations; and the indispensable needs of our physical faculties must be brought into conscious harmony with imperious laws of nature, and with the highest problems of life. For only by this means can we bring those laws of natural life into agreement with the different demands and developments of our times, and thus secure ourselves against the disastrous consequences of disobedience to them. And so it was that modern gymnastics were so to say invented, for the special purpose of using our muscular powers for physical development, and to preserve health. They are, therefore, the necessary and natural result of a higher grade of physical culture in the evolution of life. For this purpose simple muscular exercises, or unconscious and occasional natural exercises, are insufficient in quality, and besides, for most occupations, too scanty in quantity as well. In this treatise we shall only concern ourselves with those Gymnastics which have a medical value, to be used either curatively, —Therapeutic or Curative Gymnastics,—or preventively —Hygienic or Health Gymnastics—against the illnesses, or flaws and deficiencies of our systems. Both are included in the idea of Medical Gymnastics.

It was natural that at first Therapeutic Gymnastics should be used for all kinds of chronic (non-feverish) complaints, whose origin could be attributed directly to the want of sufficient exercise. But it was soon recognised that their province may be further extended to many other ailments which cannot be directly connected with this. Though

here we must not go so far as some too enthusiastic devotees of curative gymnastics, who proclaim them as wonder-working, universal remedies, allowing scarcely anything to have any value beside them. For there is no universal remedy or panacea, nor can there be, for our complicated human organism and conditions of life, which seem almost to attract as many divers forms of disease. Nevertheless, when we impartially restrict curative gymnastics to their proper sphere, and make use of them in close connection with the general science of healing, every unprejudiced person will be compelled to recognise them as a remedy which is really often indispensable, and an important adjunct to the science. In order to place before my readers the true grounds for forming a judgment of the nature of curative gymnastics in general, and a proper estimation of the remedial powers of bodily exercise, I must endeavour to make them realise, at least in general outline, the physiological significance of the organs of movement, — the muscular system, — and the part which these occupy in the economy of the entire organism.

The human organism is constituted with a view to the complete activity of all its parts and organs. If, then, we desire to develop ourselves in accordance with this view, and so preserve a normal, i. e., sound state of health, we must maintain that activity of mind and body which our individual powers require. But complete activity of the body by muscular exercise and movement is far more necessary than that of the mind, as the following considerations will show more clearly.

The whole organic life is based upon the constant renovation of its materials, the evacuation of old material which has been used up in the process of living, and the reception or adaptation of new organic material which the body acquires from foods and from the air we breathe. The fires of

life are continuously maintained from the first pulsation to the last by this change of material, and so long as we keep within the limits of our individual and naturally diverse constitutions, we shall be constantly increasing in vigour and staying power by promoting this renovation of our material, this invigorating change of matter. If we would increase in health and strength, we must constantly renew and reinvigorate every part of our body. If this process be hindered, except for short intervals only, illness, disease, and death must ensue. Thus, one of the most common causes of obstructions in the development and continuity of the chemical process of life is insufficient combustion of material and insufficient evacuation of the used-up, and therefore useless, particles of matter; for when these are retained in the body, there must be a disturbance of the equilibrium between their consumption and their assimilation. In the same way, premature old age is caused by the continuous weakening of the power of organic renovation, which may be brought on either by insufficient or excessive use of our powers, or of our material.

But in order to promote the renovation of material and organic reinvigoration of the body, we must maintain the activity of its organs with suitable intervals of rest. Now the muscular with the bony systems are by far the most substantial of all the systems of the body; and the muscles (or flesh) belong to that class of organic tissues which possess in the highest degree the power of transformation or renovation of their material, and this is maintained by their appropriate use and activity, through the contraction of the muscular fibres in the movements of the body. It is clear from these two causes that the muscular system must be, more than any other in the body, specially adapted to promote general renovation of matter in the quickest, most powerful, and most complete manner, when in full activity.

It can also produce a natural healthy stimulation of the chemical process of life, renewing and reinvigorating the blood with all the other humours of the body, and thus bring about an all-round increase of energy.

For as the blood is the common source of nutrition for all parts of the body, so by the reaction from the activity of the muscles, the supply of blood, its whole circulation,—itself mechanically maintained by the contraction of the muscles sending on their way the circulating humours of the body,—the preparation and blending of the blood and thus again all the digestive action, the healing process, the excretive process, in short, the whole organic machine, is brought into more vigorous movement.

From this we experience that instantaneous increase and invigoration of the action of the heart and of the lungs, with development of warmth, and, after continued exertion of the muscles, a greatly increased appetite for food and drink, with more abundant excretion of perspiration and urine, and, in consequence, a profounder and more refreshing sleep. And then, as a lasting gain, there will ensue an increase of all our powers, with greater ability to support all kinds of exertion, extremes of heat or cold, hunger and thirst, want of sleep, and other disturbing influences, as well as greater resistance to all kinds of epidemic disease. It has been proved by physiological calculation and experiment, that anyone in constant muscular activity completely replaces the materials of his body in about four or five weeks, whilst a muscularly inactive man, who lives otherwise under the same conditions, requires at least from ten to twelve weeks for the same purpose. And the substance of the muscles, when vigorously exercised, becomes fuller, firmer, more tense, while the useless deposits of fatty and inert cellular tissue disappear. Since, then, it is clear that in the active use of our muscles we possess the best means for

evacuating most rapidly old and useless, in exchange for new and vigorous, blood materials, this must be equally efficacious in preventing obstructions and deposits as in removing these when already there. By this means one of the predispositions will be removed which lays us open to the daily attacks of disease germs from outside, by enabling them to develop their deadly activity within. It is true we must not forget that to completely attain this end of preventive and curative treatment, our whole manner of life must be regulated in accordance with it, and frequently it is even desirable that we should put ourselves under medical advice as well, although the most efficient and most natural remedial agent must ever be that active use of the muscles which will be suitable to the individual conditions of our lives. The maladies most benefited by this treatment are those stomachic ailments so frequently chronic in advancing years, with all their various consequences: indigestion, constipation, congestion of the liver and the spleen (of the portal system of veins), with their consequent painful affections of the brain, especially congestion and hypochondriacal and melancholy humours, etc., or, again, those more youthful elements connected with poor or defective blood formation, such as anæmia, scrofulous conditions, etc. In addition to the general use of gymnastics for this class of ailments, a more direct and special mechanical healing process may be useful in connection with the special gymnastics for the abdominal muscles, to which we shall return shortly.

There is still one other mechanical influence, which is closely connected with every general movement of the limbs, and producing that activity in all the pores of the skin so important for health, that it must on no account be forgotten. We refer to that gentle, salutary friction of the skin produced by our clothing, even when it is quite loose, in any movements of the body.

Another physiological relation, under which activity of the muscles produces good results in our general health conditions, is the close connection and co-operation found to exist between the muscular and nervous systems, i. e., between the nerves of movement and the nerves of sensation. For clearly all comfort, whether of mind or body, depends immediately on the absolutely normal condition of every part of the nervous system. It appears to be especially important that those two sides of the nervous system should be maintained in equal balance with regard to their conditions of excitability and activity. One side can only be brought beyond the point of equilibrium at the expense of the other, but it can also only regain this equilibrium by means of the other. It is on this relationship that the action of muscular exercise according to the individual capacity depends for its beneficial use as a means of relieving or drawing off the causes of nervous overstrain, and refreshing the mind by gently strengthening and stimulating the system while it soothes the over-tense nerves. Under medical direction this may become a most important remedy, or, in any case, an indispensable agent for the cure of all cases of muscular paralysis, extreme excitability or dullness of the nervous system, nervous hypochondria and hysteria, unhealthy enfeebling pollutions, diseases of the mind, and certain chronic convulsive ailments such as St. Vitus's dance, epilepsy, etc. We may also remember that there is another advantage of some importance for the mental side, in the fact that as the normal government of the physical side by the mind increases, our powers of will and action are generally strengthened, we become more determined, more high-spirited, more reliable through the regular exercise of our will in practising energetic movements of the body, and by perseverance in overcoming physical sloth and love of ease through psychological

force, we may also hope to overcome that dangerous moral enemy against which the most careful physical treatment alone is of no avail.

Finally, medical skill will find the influence which muscular activity produces upon the increasing compactness of the bones and ligaments, as well as generally upon the positions of certain parts of the body, to be not only useful but even indispensable. For the framework of the bones and position of the muscles in the human body (especially in the trunk) are constructed in such a manner that the development and tension of the muscular fibres constitute an important factor in the posture, the form, and the relative curves of our figure. This is especially true of the upper part of the trunk, i. e., the chest; a great number of diseased conditions arise principally from insufficient space accommodation in the thoracic and abdominal cavities for organs which are of great importance for life and health. This is easily explained by the fact that a large class of persons scarcely ever make active use of those muscles which chiefly move the arms, and being placed in and about the chest mainly determine its development. (See, further, below.) If, then, we would restore these contracted, displaced, or otherwise mechanically compressed organs to their normal freedom of action, or if this be no longer possible, render this at least more attainable, the first and most important condition must naturally be an increase in their space accommodation. And the only means by which we can attain to this is by a gymnastic training in accordance with the powers of each individual. We must endeavour here to strengthen and build up the framework of the bones, with larger space accommodation, by extending or equalising, now special parts of the trunk, now its whole capacity, and especially that of the thorax, by the working of the muscles, and the mechanical expansion or compression which these produce. If any

one doubts the possibility of changing the space accommodation of the bony framework of the chest by these means, I can assure them that from my own measurements I have frequently found an increase of one and one-half to two inches in the circumference of the chest (after deducting the increase of muscular flesh), even in full-grown adults, after a few months of gymnastic treatment. We may easily estimate the important amount of cubic space capacity in the chest to be gained in such cases.

Hitherto we have been speaking of gymnastics, in so far as they are connected with definite curative treatment. But when we observe closely the every day physical life of the class which may be called the inactive class, and to which nearly all of the higher ranks of society belong, we at once recognise the need for the general use of hygienic, i. e., health-maintaining, preventive gymnastics, which should tend, not to the healing of diseased conditions already in the system, but to their prevention.

For if we compare their activity with what we may reckon as really sufficient for health, the average amount which should be taken of any common bodily exercises,* we at once recognise that not only is the sum and intensity of their movements far below the normal standard, but also that the kind of these movements is in the highest degree one-sided and insufficient. For when walking is considered to be the only attainable kind of exercise, we neglect to develop,

* We must now consider more closely than we did before (page 00) this average amount. For example, it may consist of about four hours, spread over the twenty-four, spent in garden work of different kinds, whether severe or light, according to circumstances. How few men have the power to do anything of the kind regularly without inconvenience! How much muscular energy lies dormant in inactive bodies, which is being constantly produced there. Naturally, in course of time, the reproduction of this energy, and with it many other still more important functions depending from it, gradually disappear. Any fresh spring will become choked and its quality deteriorate when the outflow does not correspond to the intake, when its water is drawn upon either never, too seldom, or too sparingly.

and so allow to waste, four groups of muscles of great importance for the active process of life. These are the muscles (1) of the shoulder, (2) of the thorax, — both of these through the slight activity of the arms, — (3) of the abdomen, (4) of the back — both of these last-named through the insufficient movement of the trunk while walking.

First as regards (1) and (2). The muscles placed about the shoulders and heart are meant to produce not only the movements of the arms, but the rhythmical expansion and contraction of the chest-walls as well, in which the machinery of the breathing process consists. But the circulation of the blood in the lungs depends on the quality of the breathing powers, for it produces that restoration, or chemical vivification of the blood by means of the constant exchange of its particles with the external air, which is so continuously needful in order to maintain life. Without breath a man can exist for scarcely a minute, though he might for several days without food and drink. For this reason all the energies of life stand in direct relation with the breathing powers. Through want of movement in general, but especially of the muscles of the arms, the breathing becomes weaker and less profound. The elastic framework of the chest either does not attain its full development, depth, and breadth, or the heart sinks gradually inwards. By degrees disposition to dangerous diseases of the lungs (consumption), and of the heart is produced, with considerable disturbance of all the assimilating powers, all in consequence of the insufficient supply of oxygen (constipative diseases, gout, stone, etc.). So that we must not only be careful that we breathe a pure air, but we must give special heed that we CAN inhale SUFFICIENT QUANTITIES of the pure air into our lungs. And we shall only be able to do this if we maintain the breathing muscles in their FULL WORKING CAPACITY. Anyone with good breathing power can withstand the bad

effect of impure air much longer than anyone with inferior powers, because he will still have the necessary amount of oxygen in the larger amount of inhaled air (though it be less rich in oxygen) for a longer time than the other. This is very important, because we cannot always breathe absolutely pure (well oxygenated) air.

With regard to (3). The abdominal muscles form that pliable sheath of the stomach which almost encloses the space between the ribs and the bones of the hips; and being composed partly of flesh and partly of sinew, their contractive powers, which are generally left to chance or arbitrary use, serve to promote and strengthen the functions of the abdominal organs (the digestion and circulation of juices, in evacuations, deliveries, etc.). They also keep in position and protect these organs in any energetic movements of the body, or feats of strength and endurance; they are used, too, in expiration, in speaking, singing, crying, laughing, coughing, and in the various movements of the trunk; so that we readily understand the many evil results from the imperfect development and inaction of these muscles. We can trace directly from these the inaction and congestion of all the functions of the abdomen, the origin of ruptures, and in the female her difficult deliveries in childbirth.

Digestion and breathing are the two most important processes of animal life. The first mauufactures blood out of food, the second invigorates it until it is able to maintain that organic renovation and constant exchange of material which are the primary conditions of life and health. Both of these processes should be maintained in well-balanced relations between themselves and with regard to the needs of the entire organism; and to preserve this equilibrium should be the chief object of every physician's endeavour. And yet the immense importance for health of the breath-

ing process, and the development and care of the breathing muscles, are even now by no means generally nor sufficiently recognized.

With regard to (4). The muscles of the back are used in stretching, holding oneself erect and straight, as well as in side movements of the spine (and therefore of the whole trunk), and also co-operate in the inhalations and exhalations. Their quality and activity have accordingly, from several points of view, of great influence on the whole process of life. For upon them depends that upright bearing of the trunk, which is so needful for the free performance of the functions of the breast and abdominal organs, which are sure to suffer from a long-continued bent or sunken carriage of the trunk; they are of especial use, too, in youth to maintain the spine and the whole body in perfect shape. The insufficient activity and development of the muscles of the back constitute a by no means negligible factor in most deformities of the spine. But the strength and activity of the muscles of the back are, from other standpoints, of great and general importance, namely: (*a*) because the spine, from its position in the central line of the body, forms the main support and stay for the other movements of the body, whose intensity is more or less dependent upon the tension of the muscles of the back; (*b*) because most probably the energetic use of the muscles of the back has a direct influence on the circulation of the blood in connection with the spinal marrow, nourishing it and strengthening its normal, and preventing abnormal, reflex actions, — diseased tensions and dispositions of the nervous system, — and enabling us more easily to overcome outside attacks with vigorous reactive powers. When the spinal marrow is full of freshness and vigor it constitutes one of the best preventives against general weakness and excitability, against that many-headed enemy, hypochondria, hysteria,

etc. When we study carefully the usual health conditions of the physically inactive classes we are convinced of the truth of this, and can easily trace most of their complaints to the same source. For either, as is so frequently the case from the want of exercise in youth, the body is sluggish, and has never attained its full normal development. It is defective or deficient either in outward form or in the internal functions, and never attains to a vigorous and unfettered manhood or womanhood. General poverty of blood, or defective conversion of the juices, hems in the youthful life with a numberless band of ailments; outside attacks easily overcome such a tender blossom, and serious diseases, especially of the chest, threaten a life which should be in its prime. Or, on the other hand, the want of exercise is occasioned by the circumstances amid which the maturer years are passed. Youthful vigour often for some time counteracts these disadvantages, and appears not even to feel the physical cravings of our nature. But, as a rule, this can only last till middle age. If not before, at least then, those hitherto unknown symptoms begin to make themselves felt, arising no one knows how, which are usually called the ailments of middle life,* — the host of chronic ailments of the

* Then the unwearied energy of youth has departed. And if the wheel of life is still to revolve at its highest speed without beginning to show signs of slackening, it will depend first on the care taken in the springtime of youth, of the powers allotted to each individual; i.e., whether he did not allow them to be overgrown with sloth or exhausted with extravagant abuse, but by *appropriate* use of his working capital, through the full development of every part, he increased and cultivated it as much as possible; and secondly, whether if when the life is already past its prime, and no longer enjoys that superabundant energy which laughs at fatigue, it is renewed and supported by careful rules, and by simple and natural stimulants, among which muscular activity will ever be the chief to be adopted after unprejudiced self-examination and reflection. The most general and most important condition must now be a more careful observation of the amount of material absorbed by the body, and the amount of energy it can produce, so that these should balance each other; or, more precisely, the activity of the organs of intake (of digestion and breathing) should be equal to the activity of the organs of out-go, — the nerves, the muscles, and the glands. The physical man, during the

bowels, hemorrhoidal disorders, stoppages of the blood, signs of gout, asthmatic symptoms, hypochondria, hysteria, melancholy, paralytic symptoms, attacks of apoplexy, and so on. Those will be wise who understand and obey the first hints of Nature demanding her rights; for prevention is better than cure. If we do not think of our body before we are reminded of its existence by illness or pain, it is then often too late. For it is a possession entrusted to our guardianship and *protective* care. Even the most judicious treatment often meets with limits beyond which nothing remains but resignation to the inevitable.

We have thus lightly sketched in a picture the original of which we are constantly meeting under varied forms in real life. We are certainly not far wrong when we reckon physical inactivity, though not the sole, yet at least one of the most important original causes of the dangers we have here depicted.* From it we realise the absolute necessity for

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second half of life, lives upon the interest of the capital of those powers he amassed during the first half. Well for him if he has not in youth consumed that capital, but by careful stewardship of the revenues, has rather increased it. The revenues are those organic powers which should be carefully husbanded, and be used in the further development of our capacities. The capital is that ability to continually reproduce and perfect fresh power, — the innermost spring of vigorous life. The time for increasing our capital is past. We can only continue to enjoy our revenues by careful husbandry, by suitable usage of our strength, by careful spending of our stored-up materials. By this means alone can we preserve our capital of vigorous life untouched (at the highest point of physical vigour) so long as possible; i.e., until by the laws of nature we are obliged to consume it in old age.

* The most important of the other causes are (*a*) general disregard of the importance of the breathing system, and insufficient care for the inhalation of as much pure air as possible. (*b*) The constant use of hot condiments, spirituous drinks, coffee and tea, which, though we may not feel it through long-continued habit, yet even when moderately used, certainly has a bad effect on the health; though under special circumstances, and for those whose senses are not dulled by habitual use of them, these stimulants are excellent as medicines, during unusual exertions, extremes of heat or cold, sea voyages, etc., when taken occasionally, but are never good when taken for pleasure regularly every day. (*c*) Sexual exhaustions. (*d*) Indulgence in too great luxury for mind and body, laziness and surfeiting of the senses, want of balance between our powers and the demands we make upon them, and the want of harmonious physical and moral energy, which is due to our faulty up-bringing.

hygienic gymnastics for all those whose conditions of life allow of almost no other form of muscular activity than simple walking. For even if there are to be found here and there some people who escape the heavy penalties of taking insufficient exercise, yet every one of these at least must suffer from premature old age and infirmity. Their bodies will be bowed and bent, their limbs become stiff, and their general strength will decay. If we lived in a fairly normal manner, we should feel no infirmity before sixty or seventy years of age; for that men who keep their muscular powers in constant use, and live otherwise by nature's rules, even under less favourable climatic conditions, preserve their full activity even into the seventies and eighties, is by no means to be wondered at. To live *soberly*, *actively*, and *contentedly*, are the three rules of the Philosophy of Health, and if we obey them we may hope for a contented old age. And in closest connection with them are the commands of the Ethical Philosophy of life —

"Strive after full command over thyself, over thy spiritual and bodily weaknesses and wants. Begin this warfare bravely (*sapere aude*), — at whatever period of life you may have arrived, it is never too late, — and persevere unweariedly in the struggle for this true (inward) freedom, for the perfection of self. By this means, within the limits which are marked out for this earthly life by a Higher Power, thou shalt go on from victory to victory until thou comest to the final goal with the blissful consciousness that thy life-task has been worthily performed."

For in the true performance of these two commands — of the hygienic and of the ethical — lies the whole secret of the most difficult, but the most noble and most important, of all sciences, — the science of life, the science of living *well*.

II.

The Value of Curative Home Gymnastics in Particular.

As our title states, this book has been written to show what is meant by Curative Home Gymnastics, i.e., the systematic use of *independent* exercises; (i.e., those which do not depend upon apparatus or assistance, and are therefore practicable in any place and at any time). This does not, of course, embrace the whole field of *medicinal* gymnastics generally, because for many of its purposes, such as the orthopædic, etc., such *special* arrangements and conditions (apparatus, constant immediate medical supervision, etc.) are necessary that they are only possible in gymnasia. And yet the Home Gymnastics are so varied that they are quite sufficient for most medical purposes, and absolutely all the general advantages for health which have been hitherto ascribed to gymnastics may be derived from them. And when we consider that only few of those who need our help can, for various reasons, make use of gymnastic curative establishments, and that, on the other hand, Home Gymnastics, whether practised in a room, an arbour, a vacant space in the open air, or anywhere else at home or abroad, need neither special arrangements and apparatus, nor the assistance of other persons (like the Swedish Healing Gymnastics), but can be practised at will under any conditions, we shall assuredly estimate them at their true value. And, further, when any one has gone through a course of Healing Gymnastics in some institution, they are enabled to continue this

much more completely afterwards, and according to regular gymnastic methods.

In short, the aim of this book is to make special movements of the body of recognised importance for the cure of numberless ailments and diseases, for physical development, maintenance of health and activity into advanced old age, accessible, easily intelligible, and directly useful to doctors, patients, those physically inactive, and to parents, and teachers, under all circumstances; in a word, to bring every one to realise the means of health which lie within themselves.

But these simple and natural movements of the body must be arranged in a complete and systematised order, and the real physiological purpose of each understood, if we would win their healing powers from them. For their practical value for all cases is only realised when we can select from the general system what is required in each individual case, and can apply it in accordance with the circumstances of that case. For the same end will not be attained if we perform any of these movements in an arbitrary fashion, but it depends on which movements we make, and in what manner, how long, and how often we practise them; in short, on the quality and quantity of the movements suitable for the individual case.

This system will be most acceptable to those chronic invalids for whom active exercise is prescribed by their medical advisers as a duty, and who were very much embarrassed by the vague ideas they had of carrying it out. Thus, for instance, all those who make use of drinking or bathing cures, either at home or in bathing places, will find in it a long-sought means of taking their proper amount of exercise in a more perfect, complete, yet specialised and easy manner than they otherwise could do. It is well known that one of the principal conditions of benefiting by such methods of treatment is regular, and even frequently severe, exer-

cise. In many cases of this kind all further treatment becomes quite unnecessary, as we shall constantly be better able to understand and recognise. For while walking, which hitherto was almost the only form of exercise possible, is certainly very wholesome, especially when it is connected with constant enjoyment of fresh air, and can be practised in pleasant surroundings, which give variety and refreshment to the eyes and mind, yet it is altogether insufficient. For, besides that this form of movement, as we observed above, is by itself too one-sided, and therefore cannot be adapted to the special or prescribed methods which are indispensable for medical purposes, the regular practice of it is also liable to be interrupted much too often by continuance of bad weather, or extreme heat; or the nature of their complaint may render walking impossible for some patients. Gymnastics, on the other hand, afford the surest method of coping with all these difficulties, and completing the treatment, so far as it consists in exercise, according to a special and regular method suitable for each invalid. I therefore believe that even all those who have both the powers and the opportunities for regular walking exercise, will yet do well to do a certain amount of gymnastics daily, both for the sake of their general health, as for the thorough assimilation of the water they have to drink,* and then afterwards pass as much time in ordinary walking or other exercise as they may find beneficial. We may note, too, that in these bathing places and spas, where, as rule, many sufferers with similar complaints are constantly meeting, patients have better opportunities than elsewhere to make up small parties for gymnastic exercise, and thus by pleasant companionship increase the beneficial effects of the exercise. And many an embarrassing difficulty will be pleasantly and easily obviated for medical men who may be

* For this purpose the body movements described later are especially suitable.

directing these courses of treatment, and who must provide some form of exercise which shall be both continuous and regular, and yet suited to all the different maladies of their patients.

In order to attain the end proposed in this book as completely as possible, I have been at some pains to arrange in order all those forms of medical gymnastic movement which, being independent of apparatus and other conditions, are both suited to this purpose, and also practicable under all circumstances. The movements are arranged anatomically, and, as they cover, when taken together, all the muscles that move the different parts of the whole body, they constitute the basis from which all the countless movements of daily life (working movements) have their origin.

By this system, any one will be enabled to procure for themselves without difficulty all those important benefits for every part of the body which the different divisions of the labouring classes now enjoy through the labours of their calling, and though the movements of each special calling have not the all-round character of gymnastics, they are yet sufficient to counteract in great measure those other unhealthy influences to which working people through the circumstances of their lot are exposed. One can easily in other ways procure the same amount of fatiguing exercise, but nothing can be so well suited to develop every part of the body and invigorate all its functions with a free activity, while it satisfies at the same time any special medical requirements. For these movements are most beneficial in the development of the body in a marked degree, rendering it supple, strong, active, and enduring, for the every-day needs of life, securing a good foundation for all other gymnastics, for military training, artistic dancing, etc., and when persevered in continuously, will insure a much longer conservation of bodily activity into the most advanced

years. That downward change of life which we call growing old will be thus deferred, while the powers of organic renovation, and the highest degree of physical vigour will be maintained so long as possible. The fact that our system of Home Gymnastics can be practised anywhere and by anyone makes them the best means for restoring the necessary harmony between physical and mental life in the higher grades of present-day society; nor can they for this purpose be satisfactorily replaced by any of the other usual forms of exercise. On this account they should be practised, though to less extent, even by those who are able to take the necessary amount of daily exercise, if they would keep every part of their body constantly able to perform any natural movement. How important this all-round activity, the muscular responsiveness developed by it, and the generally enhanced vitality is, not only for the ordinary purposes of life, but as a means of increasing our strength, our vigour, and length of life, will probably only be fully recognised by future generations.

When we do not make use of *all* the bounteous gifts entrusted to us by Nature, but allow many of them to lie forgotten and neglected, we offend our Benefactress. And she visits this offence, and rightly, not only by withdrawing the gifts, but with other and more severe punishment beside.

As a general rule it will be advisable, in cases where special results are to be obtained by the use of Healing Gymnastics, to consult with one's physician as to the choice of exercises, or any special modifications of them, and afterwards from time to time. The present instructions will therefore afford in the first place a means for the doctor to advise with his patient, and for the latter, the necessary security for the right performance of his prescriptions. I have, however, so prepared and arranged them that very slight indications from a medical adviser

will suffice to render any one competent to carry out what may suit them best. But where a clearly defined method of healing is not in question, but only a general course of preventive treatment, — Hygienic Gymnastics, — and no exceptional conditions, or local organic disorders are present, it will not be even necessary to take further advice. With the help of these written directions anyone, even the most hardpressed business people, — such as clerks, civil servants, students, and all whose profession compels physical inactivity, and are most in need of such a restorative, — will be enabled to satisfy this need of active movement without further help. And if once, or twice, daily they will spend a quarter, or at most half an hour, in methodised Gymnastics, they will have obtained more than if they had been walking for several hours. The Home Gymnastics will be found most necessary during the *whole of the colder season*, when through continued inactivity many a germ of disease is secreted in the system to develop sooner or later into a serious disorder. Even those unfortunate persons who through paralysis or loss of a limb, or through blindness, cannot take that regular exercise which is necessary for our general health, even when they are confined to their chair or to their couch — will find here a means of performing such exercises as may be possible for those parts which still retain their powers, and so avoid the evils of complete inactivity. This will especially be the case for all those who through physical or other causes are confined to their rooms, and feel this forced inactivity to be their greatest misfortune. How many thousands of ladies are there in the higher grades of society who, without being really ill, are nearly always out of sorts and indisposed, and yet, if they would have regular and suitable exercises, would become quite healthy! Medical advisers constantly recommend exercise, but even the best good-will is broken on the thousand and one more or less real and actual

impediments which obstruct the consistent practice of such methods as were hitherto in any way attainable, even more than in the case of the opposite sex. To supply a want so generally felt in all such cases as these has been the purpose of this work, and it has been arranged with this end most constantly in view. To make the whole as intelligible as possible, both for doctor and patients, some notice of the most important and special curative values and uses of each movement has been added to the descriptions of them. This, it is hoped, will be sufficient to ensure a better understanding of the special end of the treatment to be pursued in each individual case.

III.

General Rules for the Practice of Medical Home Gymnastics.

(1) The following illustrated exercises are suitable *for all circumstances, for all ages, and for both sexes.*— Special exceptions will be noticed as we come to them, and the constantly necessary individual modifications indicated so far as possible. Only pregnancy will always be excepted, when the necessary exercise should be very gentle, though continuous, i. e., walking exercise will be preferable to more vigorous forms of movement. In the same way it scarcely need be mentioned that in all more pronounced inflammatory or feverish conditions the exercises must as a rule be altogether given up. (2) When they are once begun they must be most persistently carried on, and more especially when sufficient exercise cannot otherwise be taken. They must be as much a part of the daily program as eating and drinking; and even when a special curative application of them has been successful, they must be persevered in, although perhaps in a modified way. For only under these conditions can we be sure that their really healing properties will be maintained. Every sensible person should readily make such a small and easy sacrifice for the sake of his health, nor should he allow himself to be deterred by the wearisomeness of it, for sickness and infirmity are far more wearisome. The chief requisite is a persistent earnest will, which is certainly wanting to most of the present generation.*

* This is the vantage-ground for quack doctors, to humor our love of ease with lying advertisements of their marvellous remedies. But the highest goods of life

In general, then, we may advise that also in this direction too much self-confidence be not indulged in, but by constant reinvigoration of our purpose we should guard our own love of ease against the many apparent good reasons for relaxation, until — and this generally soon follows — we come to look upon it as a wholesome and habitual natural want. (3) The most suitable time for the performance of the exercises is that shortly before one of the daily meal times, whether it be before the breakfast, midday, or evening meal, so long as at least a quarter of an hour of rest is allowed between, so that the excitation of the muscles does not interfere with the digestion. The stomach should be as nearly empty as possible. On this account it is advisable to have evacuated the bowels and bladder when needful, beforehand. Another reason for combining the exercise with one of the daily meal times is because these are for most of us regularly fixed, and are in any case the best method of recalling them to mind.

Whichever of these three times be chosen is not altogether unimportant, but as a general rule makes no very real difference so far as the curative purpose goes. And as the special end and the individual circumstances and conditions are constantly varying, it is impossible to give more exact definitions here on this point, but they must be left to the self observation and consequent decision of each one for himself. The reader may compare what is said here with the remarks on page 35.

(4) *All tight-fitting clothing about the neck, chest, and stomach should be removed beforehand.*

(5) *If there be any disposition to marked determinations of blood towards internal parts, or to hemorrhages, or any serious*

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cannot be bought, they must be won by individual work, and so must lost health by a reasonably regulated and settled mode of life. The sacred laws of nature do not admit of trifling.

organic changes in important parts, or where ruptures of abdominal walls are present, or a tendency to this exists (see later direction No. 7), the exercises must be only undertaken after a most precise individual selection under medical direction and advice.

In all such cases the sixth rule which follows this must be specially observed.

Those who are suffering from rupture should never commence even those exercises which are suited to them, unless the rupture is completely kept in place by the truss, though it need be no impediment to the practise of the exercises; and in cases of disposition to rupture they are specially to be recommended, as it is precisely for young people where the opening of the rupture may unite under a suitable truss, that the exercises which might promote this will be found of the greatest value.

(6) When the breathing and action of the heart are much accelerated by any exercise, time should be allowed for them to return to their normal condition before passing on to the next.

(7) The pauses between the exercises should be utilised (if there be no cough irritation) for deep and regular breathings, — a calm, full, and strong in- and exhalation to the fullest extent of the powers (the inhalation as if yawning, the exhalation till the last possible particle of air is driven out), and in order to make this as easy as possible, the arms should not hang loosely, but be lightly posed on the hips, and so the breathing movement will be relieved of the weight of the shoulders. These breathing gymnastics are one of the most important and most beneficial exercises (in the case of well-developed people they take place, it is true, automatically; but even then, as a rule are not sufficiently carried out). They promote directly and very considerably a full development of the powers, they keep the lungs clear and healthy,

and invigorate and purify the whole circulation of the blood (especially the abdominal circulation). If a habit of taking every day a series of such respirations be acquired, which may be done when out walking in pure, good air, besides during the pauses in the exercises, the capacity of the lungs will be increased for the usual automatic respirations as well, and the whole organization be strengthened and raised to a permanently higher level. We recommend, therefore, most earnestly these breathing gymnastics to all inactive persons. For in their usual occupations, which give no opportunity to develop their arm and chest muscles, they scarcely ever use more than half their lungs; the other half remains inactive, and therefore is usually, and even in early life, obstructed and deteriorated, and thus rendered useless for breathing, as we frequently learn in dissecting such cases. As a consequence, consumption is rife in youth and middle age, and asthma * in old age. We shall describe later how the uneven use of the lungs may be remedied by deep breathing.

(8) The exercises must be performed *quietly* (not hastily, and with suitable pauses between each) but *tensely*, with *vigorous use of the muscles*, and in *general*, *adhering as closely as possible* to the illustrations and descriptions. Anything slovenly, awkward, or jerky should be avoided, as well as any other movement which would distract the attention. Each movement should be clear and smooth, though this as a rule will only be attained through practice. But by this means alone can we learn to concentrate and direct our energy on our powers of action. And only when we carry out these

* Under the term sthma, as describing a disease, a doctor will specially understand the so-called bronchial asthma, while a layman would give this name to any kind of shortness of breath, such as occurs in the destruction of the air-cells (Emphysema), in diseases of the vascular system, especially of the heart, and many other maladies. It is in this wider meaning that both here and later the term asthma is used.

movements tensely and correctly, through continued practice, shall we feel the really health-giving results. Any one will soon recognise from the sensation immediately following the movements, the great difference between carrying them out superficially and lazily, or thoroughly and in the best way possible. But if any one through some bodily defect, cannot perform those exercises specially desirable for his case, he should at least do what he can. For the system can be used beneficially *by every one* without exception, even the oldest or the most infirm, if they will only take pains to select what suits them.

(9) To arrive at what we desire by these gymnastic exercises, we must before all things keep to the right *quantity*. Naturally this varies with the individual, and especially at the commencement, must be less than can be gradually attained to by practice. So far as general rules are possible I shall denote an average standard both for the separate movements, and also when drawing up the special instructions, so as to give some reliable indication of what will be for all cases neither too much nor too little.

And here we must carefully observe two principles. (*a*) That a sensation of fatigue should be felt, but should completely pass off during the succeeding period of rest; (*b*) and that no sharp muscular pain remains afterwards, though the painless sensation following muscular exertion, which beginners especially experience, is clearly by its rather agreeable character neither abnormal nor injurious.

These two principles must never be disregarded, especially at the first commencement of the exercises. So that if at first, in spite of all precautions, sharp muscular pains are felt from time to time (and this may happen after a very slight amount of unaccustomed exercise to some individuals) these should first be allowed to pass off, and then a new start made with a diminished amount of all the exercises. As

soon as any one is to a certain extent accustomed to the movements he will be able to perform twice or three times as much as he did at first.

Beginners should never give way to the mistaken idea, so common among elderly persons, on account of the initial sensations and difficulties, that it is quite impossible for them to perform or support the exercises, but should take heart and begin afresh to carry them out, carefully noting how much they can conveniently do. If — as especially happens with elderly persons — any one is not quite successful in one or other of the exercises, at least let him do it as well as possible, though without any overstrain. Gradually even old muscles will make wonderful progress. But the idea that the more you do the more benefit you derive must be discarded, just as in any other medical treatment. Only so long as the increased vigor derived from the exercises keeps pace with the nutrition, i. e., with the renewal of used-up organic material, can any real benefit for the health be obtained. Once this limit of sufficiency is passed, the contrary element steps in. If the muscular fibres are overstimulated, they will gradually become stiff and hard, organic deterioration will set in, and they will become less and less serviceable. Instead of reinvigoration, there will be deterioration, enervation, and exhaustion. Those suffering from chronic disorders should especially beware of too easily giving way to impatience, and being eager to arrive at the desired goal at once and by violent measures, for it lies in the very nature of these disorders that this cannot be. If a course of healing gymnastics be rightly and wisely directed, the result, which is really worth the pains, will surely, but as a rule only *gradually*, follow. Therefore, once more, progress must be made step by step, with measured regularity, and according to fixed rules. Each individual must preserve a due balance between activity and repose as the foundation of well-being for all his organs and powers.

Whether, then, we have to do with hygienic gymnastics generally, or with those pursued with a special medicinal end in view, we must always remember, that insufficient all-round muscular activity, as well as an unbalanced excess of it, in the long run must be hurtful, and that either of these, besides other attendant evils, in the end are certain to bring on premature old age and death. Proofs of the first are constantly in evidence among the higher grades of society, proofs of the latter among all those of the lower orders who pass their lives in excessive toil the whole day long.

(10) When after continued use an increased exertion of the muscles becomes supportable and even advisable, this can be best attained in all movements of the arms by the use of dumb-bells of two to at most six pounds in weight, and then gradually increasing the exercises as before when the hands were free.

But here we must remark that most people are inclined to use too heavy dumb-bells. By this means the free gymnastic exercises too readily become trials of strength, which may be good for healthy people, but were better avoided by invalids and weakly persons. I would recommend even healthy people, so long as they are only practising home gymnastics, not to use dumb-bells of more than two pounds weight. Women, children, and invalids will do well not to use them at all. If these want to increase the exercises, it will be more advisable to increase the number of the movements, as will be shown later, rather than make the exercises more severe ; for any one who is accustomed to an hour's walking on the flat daily, will be less fatigued if he prolongs his walk, than if he tries hill-climbing instead.

In order to facilitate the instructions given above, a capital D will be prefixed to each description in the next part in describing the separate exercises, where dumb-bells may be used.

(11) Those who would combine the use of the exercises in their rooms with *the enjoyment of fresh air through an open window*, can be thoroughly recommended to do so, even in cold weather, though naturally under ordinary rules of prudence. Vigorous exertion is the best protection against taking cold. In cases of chest complaints, this will of course depend on whether the condition of the outside air be suitable or not.

But in any case, pure air must be always breathed during the exercises.

(12) The arrangement of all the other conditions of life depends materially upon the state of health of each individual. As is usual in regard to health, the purpose will be best answered by a simple and regular though not anxiously pedantic method of life, especially by a diet* devoid of stimulants, i. e., avoiding as much as possible sharp spices and fiery drinks.

* The most usual form of excess is in the amount of food and drink taken daily. The blood is continually overloaded with unused material, and the health is thus gradually undermined; most persons in the upper classes partake of too much food without knowing it, because the natural appetite of the stomach has been unheeded, while a spurious appetite of the palate has been stimulated by various artificial preparations, though there need be nothing harmful in these when only used to satisfy hunger; or because even the stomach, through a constant bad habit of overeating, no longer experiences its normal sensations when satisfied. Assiduous stimulation of the appetite through strong spices, drinks, etc., may perhaps be excused as a medicinal remedy from time to time, but will be always harmful when constantly used, partly because it benumbs the nervous system, and partly because it induces the stomach to desire unnecessary food, and in consequence the blood is overloaded with useless material. Here, as in other things, we must subordinate the attraction of the senses to the reason and will, and so find even in these matters opportunity for practising self-control. The surest and most general rule will be a sensation of lightness and freshness after each meal. Any feeling of fullness, even the slightest, which overpasses the limits of comfort, is proof of the contrary, and affords any one who is careful the true standard for future occasions. We must also note that with advancing age the need for nourishment becomes somewhat less in proportion to the slower consumption of material, as well as the physical capability to recover after too large enjoyment of food. If any one would still in old age partake without hurt of the feasts of a Lucullus, he must at least be armed with the fortitude of a Stoic.

(13) The regular exercises when indisposed should only be deferred when the general health is seriously disturbed. The monthly periods of the female sex do not require a complete relaxation from the gymnastic movements, but only certain restrictions which will be given more exactly in the special descriptions and instructions.

IV.

The Separate Exercises of Medical Home Gymnastics, with Special Directions for Carrying them Out.

Preliminary Remarks.

As I assume generally that a selection of these exercises will be practised daily so far as will be found to meet individual requirements, I have endeavored to give some general and reliable rules as to how often the special movements of each exercise should be repeated together, and have placed three figures at the head of each illustration as a standard. The first of these indicates the number of times at the commencement, the second after two weeks', and the third after eight weeks' use of the exercises, and the last is the one intended for continued further use. This standard is adjusted to the adult male strength, and for average normal activity. For those over sixty, for very stout or very weakly persons, for women and children, the half of each of these figures will be sufficient. If some special or localised treatment is to be followed, then the movements which are especially adapted for this can be repeated oftener than the prescribed standard, while the rest are used less. Generally, however, the last of the three sets of figures should be regarded as a sufficient amount, and should only be exceeded in certain special exceptions, and then only for particular movements.

Many will find that the second amount will always be sufficient for them, while some must be content with still

fewer. Whether it be advisable to try to perform the selected number of exercises more than once a day will depend upon the consideration of special circumstances, and on personal observation. After some continued practice, and where some special curative treatment is being carried out, it will not only be suitable, but even advisable, to perform them twice daily, as for instance where the nature of the complaint lies in an over-abundant blood-formation, or when the treatment should be energetic and drastic. In many cases, as for instance for very sensitive or irritable natures, or where muscular pains are frequently experienced, or where the occupation is mainly a sedentary one, it will be a good plan not to go through the exercises all at one time, but to divide them into three, four, or more divisions at regular intervals during the day, so long as the last is ended at least two hours before going to rest. Any other forms of exercise may be reduced in quantity, so long as a minimum of these is regularly used.

When these and all other instructions, which will be given later for the average use, have been well digested, the exercises can be easily made to suit any special purpose, and those changes which may be here and there required, whether as regards the manner or the number of the movements, can well be arranged by personal observation.

Fig. 1.

(1) **Head Circling** — 10, 20, 30 times.

The head makes a circular movement in the form of a funnel, from right to left, and from left to right, describing as wide a circle as the joints of the neck allow. The rest of the body must remain quite steady and firm.

(2) **Head Turning** — 6, 8, 10 times to either side.

Fig. 2.

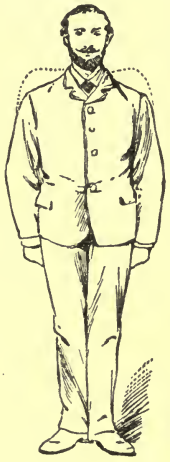
The head is turned on its own axis. If the joints of the neck are free, the turn will cover about the fourth of a circle in each direction, so that the chin comes nearly over the shoulder.

Both exercises bring all the muscles of the neck and nape into activity and help *to make the joints of the neck free if there be any stiffness in them* (if only there be no organic obstruction which cannot be remedied), *in cases of paralysis of the muscles of the neck or the nape of the neck, and of nervous dizziness.* This last is very soon diminished, as the head becomes accustomed to all the positions and the most diverse variations of them. If there be a strong predisposition to dizziness it is advisable at first to practise these exercises sitting.

(3) **Shoulder Raising** — 30, 40, 50 times (D).

Both the shoulders should be raised simultaneously as vigorously and as much as possible. They should then be lowered gently, because otherwise the head may be jarred too severely by constant repetition of the movement. As by this means those muscles are brought into play, which raise not only the shoulders but the upper ribs, the exercise is useful for bringing air into the topmost spaces of the chest in catarrh of the lungs and *incipient tuberculosis of the lungs*, which, as is well known, generally attacks the apex of the lungs first in a great number of cases, and when not taken in hand at once, continues its destructive work downward through the lung tissue, and thus produces the usual form of consumption of the lungs. The exercise is directly beneficial *in paralysis * of the muscles which raise the shoulders*, which can be recognized by the slack way in which the shoulders hang down.

Fig. 3.



In cases of inequality of the two shoulders, which is caused by one side being paralysed, or by curvature of the spine, this exercise must be performed by *one side only*, and that the lower, until they both are level.

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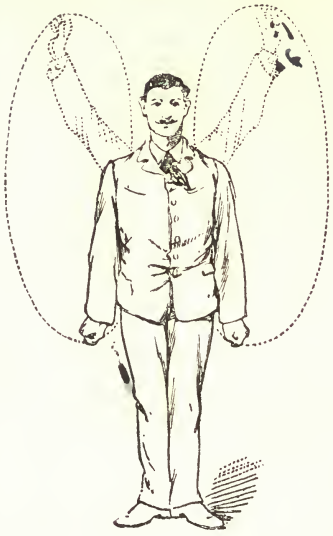
* By paralysis we need not only understand complete immobility, for paralysis (of which there are of course an endless variety of degrees), is already present when the normal equilibrium of the two sides of the body, or generally the normal position and motive power of any part is seriously disturbed. In this general sense the expression "paralysis" will be also used later.

(4) **Arm-Circling** — 8, 12, 20 times (D).

The fully extended arms describe as wide and high a circle as possible, beginning first from the front backwards, and then from behind forwards the same number of times. Care should be taken that the arms are carried close up by the head, for which naturally, complete freedom of the shoulder-joints is requisite; this in most cases will only be attained by practice and gradually.

Fig. 4.



The muscles of the shoulder, with all those surrounding the chest, will be thus brought into full and free activity. The especial result is to cause the *shoulder-joints to play freely*, and to *strengthen the breathing movements;* and the mechanical expansion of the chest, which is combined with these, may be also added. In case *of defective formation of the shoulder joints, of contractions or badly formed chests, and resultant asthma, of tuberculosis in the lungs* — in short, wherever the breathing process may be improved by curative treatment, this exercise is of decided value, as well as in paralysis of the above-mentioned muscles.

(5) **Arm-raising from the Sides Outwards** — 10, 20, 30 times (D).

The arms will be raised sideways without the slightest flexion of the elbows, and as high as possible. If the muscles

and joints of the shoulders are fully developed, and freely movable, the arms will touch both sides of the head when they are at the highest point in the movement. The muscles which raise the arms and the side muscles of the nape of the neck are those chiefly used. The sides of the chest and the spaces between the lower ribs will be thus mechanically and very considerably enlarged. It is therefore useful *to develop the breathing movement*, as well as in *cases of asthma and in lateral thickenings of the coating of the lungs, or pleuræ (after inflammation of the same), for paralysis* of the above muscles, and for one-sided movement of the lower side, where one shoulder is higher than the other.

Fig. 5.

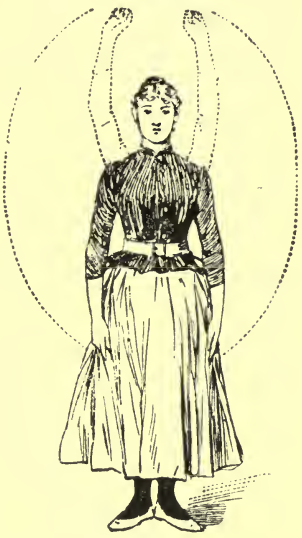


Fig. 6.

(6) **Elbows Backwards** — 8, 12, 16 times.

Both arms are set firmly on the hips, and in this bent position are forced backwards towards each other as far as possible. The back should be kept stiff. The emphasis should be given to the backward movement of the elbows, and should coincide each time with an inhalation.

(7) **Hands Fast Behind** — 8, 12, 16 times.

The back should be kept perfectly straight, the hands clasped fast behind, and the arms stretched out to the fullest extent of the elbows. This last, the important part of the exercise, should correspond with an exhalation of the breath. By means of both these movements, the shoulders will be vigorously and tensely bent backwards and by means of the latter also downwards; this will induce a more *perfect carriage of the body, and one in many respects beneficial to the health; while the front of the chest will be automatically widened, thus assisting the breathing.* It will be useful to counteract *that wing-like standing out of the shoulder-blades, and numbness and paralysis of the muscles at the back of the shoulders* (which appears in a humpy bearing, and the impossibility to assume an upright one even when the endeavor is made), and will be useful also in most cases of *chronic asthma.*

Fig. 7.

(8) **Unequal Deep Breathing** — 6, 8, 10 times after each other, but to be repeated 4 or 5 times daily.

This exercise is intended to produce an equilibrium, and is therefore only suited to those cases where the conditions of the breathing process on either side of the chest are *unequal*, and where — whether from a defective chest formation, from one-sided paralysis of the breathing muscles, or

from organic changes (as, for instance, some thickening) which may have remained after an illness in one side of the organs of the chest — *the one half of the chest* (*lungs*) *is less active for breathing than the other half.*

Fig. 8.

In a case where, as in our illustration, the right side is the most active, the hand of the same side is to be set, open, firmly against the ribs, as nearly into the armpit as possible, and so prevent any expansion while the disengaged hand is placed over the head, leaving that side as free as possible for the purpose of vigorous respiration. The hand compressing the side must be specially pressed against it during the inhalation. Breathing thus becomes deep and full, and yet quiet and orderly, as in yawning. Everything tumultuous and forcible must be specially avoided. This exercise of uneven, deep respiration, may, in the cases mentioned above, be substituted from time to time for the usual equal deep respiration (recommended page 27), though the latter should not be relinquished altogether.

(9) **Forwards Strike** — 10, 20, 30 times.
(10) **Sidewards** " — 10, 20, 30 "
(11) **Upwards** " — 4, 8, 10 "
(12) **Downwards** " — 10, 20, 30 "
(13) **Backwards** " — 6, 10, 16 "
} (D).

These are vigorous flexing and extending movements of the arms and elbow joints in five different directions. The

exercises must be carried out with the fist clenched and all the muscles of the arms quite tense. The full strength

Fig. 9.

Fig. 10.

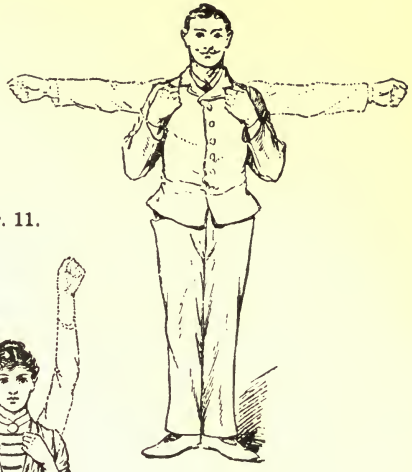


Fig. 11.

Fig. 12.

Fig. 13.

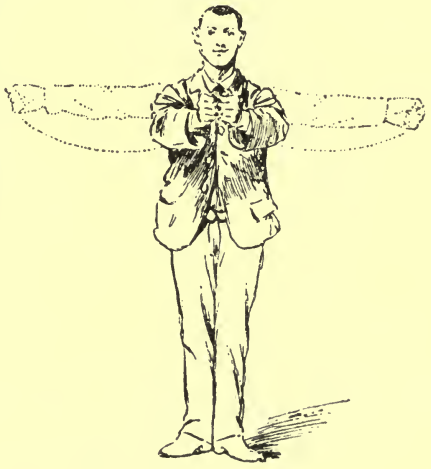
must be used both in the flexing and the extending of the arms, so long as the extending does not jar the head. The

chief action lies in the muscles which flex and extend the forearm. As these movements bring into play many comprehensive muscles (nearly all, as well as those muscles of the arm placed about the breast and shoulder), they are immediately useful, in cases where it is requisite *to complete a certain amount of all round movements*, besides this, for *giving freedom to the shoulder and elbow joints, in dull pains of a rheumatic or paralytic nature in these muscles*, and partly as *promoting the respiration*. They have no other special beneficial effect.

(14) **Bringing the Arms Together** — 8, 12, 16 times (D).

The arms from being stretched wide apart are brought levelly and vigorously together, but without allowing the hands to meet. The vigour will be used in bringing the arms together, they will be opened out quietly.

Fig. 14.



(15) **Throwing the Arms Outwards** — 8, 12, 16 times (D).

A quite similar movement, only in the opposite direction. The formation of the body does not allow of the hands being brought so near each other backwards as in the front.

The vigour must be put into the throwing back of the extended arms. In both movements the muscles in the front of the chest and those behind the shoulder are brought alternately into play, and by this means the front and the back of the chest are mechanically expanded. It thus *promotes the respiration*, and is useful in cases of *asthma*, *tuberculosis of the lungs*, and thickenings in the coating of the lungs.

Fig. 15.

(16) **Arm-Twisting**—30, 40, 50 times each way (D).

Fig. 16.

(17) **Figure-of-8 Movement with the Hands**—20, 30, 40 times (D).

Fig. 17.

(18) **Finger Bending and Stretching** — 12, 16, 20 times.

The movement No. 16 will be best carried out by imagining that a gimlet is being turned into wood while the arm is fully extended. No. 17, by describing a horizontal figure of eight in the air with the hands, and No. 18 by spreading and stretching out all the fingers as widely as possible, and then clenching the fist vigorously. By the first two exercises all the turning muscles of the arm and hand will be brought into play, and by the last all those of the fingers. They help to *free all the muscles of the arms*, the *wrist*, and *the fingers*, and are of use besides in *cases of paralysis of these muscles*, and *incipient gouty contractions of the hands and finger-joints*, and of assistance in *epileptic seizures and St. Vitus's dance*, as well as *writers' cramp*. If these special disorders are to be remedied, these exercises may be repeated in full three or four times daily so long as no painful sensations result from it. They are also useful for relieving *congestions of blood*, or *pain and irritation of the head and chest.*

Fig. 18.

(19) **Hand Rubbing** — 40, 60, 80 times backwards and forwards.

This is a well-known movement. If the palms are pressed firmly against each other, it will become a most vigorous

exercise for almost all the muscles of the arms, especially for the flexing muscles, as well as for those in front of the chest.

Fig. 19.

It is especially to be recommended where some amount of *general vigorous movement* is needed, and to prevent *paralysis of those muscles*, and for *warming the hands quickly*, and on this account, with certain movements of the feet to be described later, for relieving *congestion and nervous excitement of the brain*. This same movement can be used for the same purpose, *to relieve the organs of the chest*. But in this case, to specially exercise the muscles of the chest, any pressure of the hands should be avoided, and exchanged for a light and gentle rubbing movement, making up by a longer continued movement (repeating it twice or three times) what was wanting in the energy of it.*

Fig. 20.

(20) **Body Bending Backwards and Forwards** — 10, 20, 30 times.

While the legs are kept straight and firm, the body is bent forwards and backwards as far as possible. It should be particularly remembered that this as well as all the other following body movements must be carried out as gently, smoothly, and quietly as possible.

* As the movements Nos. 18 and 19 can be easily carried out while lying under a coverlet (for the first, the arms should be held close against the sides), they can be used alternately, with short rests between each 50 or 100 repetitions, for

The forward movement will be mainly performed by the upright front muscles of the stomach, the backward one by the motor muscles of the back. The result will be a special mechanically healing effect on the abdominal functions, if they are *torpid*, and *constipated*, etc., and a reinvigoration of the lower muscles of the back when *paralysed*.

(21) **Body Bending Sideways**—20, 30, 40 times each way.

The body will be swayed directly left and right, avoiding all kind of effort in the movement.

The exercise will be performed chiefly by the side and back muscles of the stomach, and by those between the ribs. It has a beneficial effect on the *circulation of the blood*, and the *functions of the organs lying* on either *side of the abdominal cavity*, especially on the liver and the spleen, and thus may be specially recommended in cases of disorders connected with congestions of the portal circulation.

Fig. 21.

(22) **Body Turning** — 10, 20, 30 times each way.

The body remains quite upright, and with the legs firm and the back erect, makes a full turn, first right and then left, on its own axis. The lower muscles of the back and those of the hips on both sides are most active in this move-

bringing on sleep in cases where through want of muscular exertion, or through troublesome mental exeitement and too intense thought, sleep does not come when needed. It is also a means for warming the whole of the upper part of the body in a sitting position, as in travelling.

ment, so that each time there is a mechanical stretching and straining of the front wall of the stomach on the side opposite to that to which the turn is made. By this means the lower bowels are pressed first one way then the other, and are as it were gently kneaded together, and so the *functions of these organs are aided.* It is also useful in *paralysis of the above muscles,* and when taken with No. 20, in *disorders of the spinal marrow,* if indications of these appear during the gymnastic exercises, and finally in lateral curvature of the spine in cases where the lower side is turned somewhat backwards.

Fig. 22.

(23) **Body-Circling** — 8, 16, 30 times.

The body, turning only on the hips, describes as wide and deep a circle as possible (in the shape of a funnel) from right to left, and *vice versa* alternately. At all stages of the movement, the body faces to the front, so that there is no turning on its axis here.

Fig. 23.

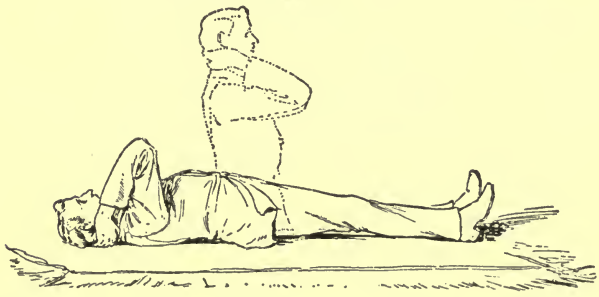
This exercise is carried out by all the muscles encircling the hips, and all the abdominal muscles as well are brought into rhythmically alternating activity. It acts as a most *thorough stimulus* on the *whole digestive apparatus,* and is therefore to be strongly recommended when *these functions are inactive,* and in the various disorders

arising therefrom. If it is immediately and especially to be used for *promoting an evacuation*, it will then be best carried out in one direction only, so that the backward half of the circular turn of the head and upper part of the body is only made from right to left, and a certain emphasis given to this part of the movement; for this will best produce through the rhythmical contraction of the abdominal muscles a downward pressure on the contents of the colon or great intestine. Then it is useful in cases of *paralysis* of the *muscles about the hips*, and through the gradually becoming accustomed to the circular movement of the head and upper part of the body for *nervous dizziness*. When this is much felt, the exercise should be performed at first in a sitting position.

(24) **Raising the Body** — 4, 8, 12 times (D).

The body should be in a completely horizontal positions. As it is not generally practicable to make use of a sofa or bed, in the illustration two mats, one above the other, are

Fig. 24.



supposed to be used. Two pillows will do just as well, placing one under the head and the other under the hips. In one way or another it will probably be quite easy to arrange for anywhere. The exercise itself consists in raising the body alone to a perfectly erect position, while the legs

remain still. Many will at first be only able to accomplish this by placing some counter-balancing weight on the feet, or by inserting them under some securely fastened piece of furniture, though they will be able to do without this later on. At first the arms should be crossed over the breast; and when it can easily be performed in this way the arms should be held level with or behind the head to increase the difficulty of the movement, as in the illustration. For increased exertion, weights or dumb-bells may be held in the hands close to the upper part of the body.

This is a vigorous exercise for all, and especially the front abdominal muscles, whose activity and condition of tenseness exerts a decided and direct effect upon all the functions of the stomach, and yet is quite neglected in the development of very many individuals. When the movement has been repeated only four to eight times, the beneficial effect will be felt in an agreeable sensation of warmth, spreading over all the region of the stomach. It is the best remedy in cases of *weakness* or *paralysis of the abdominal muscles in all kinds of chronic constipation*, and its consequent effects, and in disposition to rupture, and actual rupture in young persons.

Observation. In cases where, in spite of the feet being made fast as above, the exercise is found still to be too difficult for beginners, and further in all cases where special consideration for the habits of the individual, and the transition from them is requisite, as in persons suffering from rupture, and women who have borne several children, and who from such causes have abdominal muscles somewhat relaxed, it is a good plan to raise the upper part of the body a little from the horizontal position by cushions, etc.

The transitions can then easily be made by taking away the cushions gradually; for such cases a sofa will be the best place to lie upon.

(25) **Leg-Circling** — 4, 6, 8 times with each leg.

The leg stretched straight out will describe from front to rear as wide and as high a circle as possible, returning to its place on the ground by the other, which will then do the same; and this will be continued in regular alternation, while the upper part of the body should be kept as firm as possible.

Fig. 25.

But as nevertheless the equilibrium of the body during the movement will be somewhat displaced, a very complex muscle-action is the result, and not only the muscles which raise the leg, but all those of the lower trunk, especially those in the back and flanks, are vigorously exerted. The exercise tends to *free the hip-joints*, especially when they are *disabled by gouty rheumatism*, but of course every trace of an inflammatory symptom must be first removed; further, in cases of *muscular paralysis* of those parts and where it is desired to *relieve the head and chest.*

(26) **Leg-Raising Sideways** — 6, 10, 18 times with each leg.

The fully extended leg will be raised straight upwards, first right, then left, and in order to make the movement as perfect as possible, a certain amount of energy should be

put into the action of raising, though no violent exertion should be made. The legs should be raised alternately. The raising will be performed mainly with the muscles at the side of the hips and abdomen. The practical use of this exercise is the same as in the last, only that here, through the forcibly stimulating effort which will agitate the parts about the liver and spleen, any *congestion of the portal system* will be benefited as well.

Fig. 26.

This exercise should not be used by the female sex.

(27) **Leg-Twisting** — 20, 30, 40 times with each leg.

Fig. 27.

The leg should be held out straight with the feet pointing upwards, and then vigorously twisted outwards, and so that stress is laid on the *outward movement* (so as to agree with the normally prevailing conditions in which those muscles which twist the leg outwards are placed with regard to those which twist it inwards). This exercise will be performed more easily, exactly, and completely, when each leg completes its number of movements separately. All the twisting and stretching muscles of the leg are here in action — the value is just the same as in No. 25.

(28) **Drawing the Legs Together** — 4, 6, 8 times.

The legs should be set moderately wide apart, with the feet pointing outwards, and only resting on the toes, and then, with tense knees, should be drawn together without raising the toes from the ground. This drawing together will be performed by short alternate backward movements of each leg, so that the heels come together at the same time. A very vigorous exertion for the muscles placed on the inner surface of the thigh and calf of the leg, and very beneficial for *paralysis of the feet* and for *relieving the head and breast.*

Fig. 28.

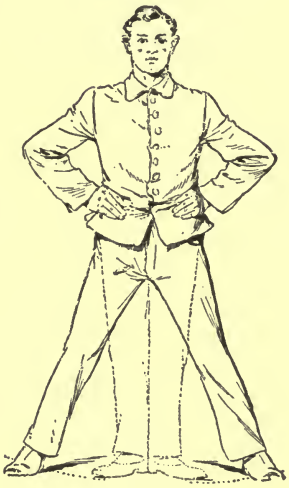


Fig. 29.

(29) **Knee-Stretching and Bending Forwards** — 6, 8, 10 times with each leg.

The leg will be vigorously bent at the knee-joint, raised forwards, and quietly, but with all the muscles in full tension, stretched out to a perfectly horizontal position. This will be done with each leg alternately. Most of the extending and bending muscles of the leg and foot, beside those in the hollow

of the pelvis, will be thus brought into vigorous action. The movement helps to free the joints of the knee, when these are *hard to move though without being sensitive to pain*, and is of service in *paralysis* of this set of muscles; it also invigorates the circulation of the blood in the lower organs of the abdomen, especially in *hæmorrhoidal congestions*, and *relieves the upper parts of the body*.

(30) **Knee-Stretching and Bending Backwards** — 10, 12, 16 times with each leg.

On account of the anatomical construction of the hip-joints, the legs cannot be raised so far backwards as forwards. The movement will be carried out as far as possible while keeping the body erect, and then the knee will be vigorously, and completely bent, then extended again as before. The movement will be best performed by each leg separately throughout, without alternation. The exercise brings into play, in the same manner as the other, most of the extending and flexing muscles of the leg and foot, though partly in an opposite direction, and the lower muscles of the back as well. By this and the other exercise together all the extending and bending muscles of the leg will be actively used. This movement is beneficial for *freeing the joints of the knee in incipient disorders of the spinal cord*, and *paralysis of the legs*, and for *relieving congestions and nervous irritability in the head and chest*.

Fig. 30.

(31) **Foot-Stretching and Bending** — 20, 30, and 40 times with each foot.

The points of the feet are to be raised and lowered vigorously, and as far as possible while the leg is held slightly forward without bending the knee, and off the ground. The whole action is performed by the ankle-joints. At the same time the toes should be bent and stretched vigorously; for which purpose, of course, the shoes must be easy, and not too small. The raising and lowering of the points of the feet may be varied by giving them a circular movement as well.

Fig. 31.

The muscles of the shin and calf, as well as all those of the thigh and foot, are brought into play. The exercise *serves to free the ankle-joints, the tarsus, and the toes*, for *relieving all the other parts of the body, prevents paralysis, and slighter contractions of the feet*, and is *a quick and radical method for warming the feet.**

(32) **Knee-Raising Forwards** — 4, 8, 12 times with each leg.

The leg, with the knee bent at an acute angle, will be raised until the knee comes as near the breast as possible.

* On this account, and because the exercise can be carried quite silently in a sitting posture, it can be thoroughly recommended as preventive of coldness of the feet, and its consequences in all such cases where circumstances make it necessary to pass much time sitting with cold feet, which may even have been wetted previously (as, for instance, out driving, or in rooms with cold floors). If once every quarter of an hour, each foot makes this movement vigorously 60, 80, 100 times, there will not be much fear of cold feet.

Vigorous emphasis should be given to the act of raising. Care should be taken to keep the body as immovable as possible, for there will always be a slight involuntary bending forwards to meet the knee. As the hip-joints become completely free, and when through practice complete control has been attained over the muscles which raise the legs, the movement will finally be so perfect, that the knee slightly touches the breast without any perceptible advancement of the upper part of the body. But here, too, every one must be careful to keep within the measure of his own capabilities, for the limits of the performance of this exercise will vary in different individuals considerably. Violent effort must be also avoided, and most benefit will be derived by those who do not exceed the limits of their own individual powers. The exercise will be best carried out by alternate use of the legs.

Fig. 32.

This is a very vigorous exercise for all the muscles which raise the leg, as well as for those placed in the abdomen, for it mechanically and thoroughly sets in motion, from two directions, inside, and out, all the organs of the abdomen. It is especially restorative and beneficial for all the functions of these organs. And it is therefore particularly to be recommended *in all chronic complaints connected with or generally arising from inertia* or *congestion of these functions*, such as *congestions of the portal* system, *sluggish digestion*, specially of the *small intestine* (to be recognised in pains experienced as a rule about one and a half to two hours after meals), constipations, flatulency (the expulsion of wind immediately after this movement is especially marked), in insufficient monthly fluxes, and hæmorrhoidal troubles, etc. The exercise is

also useful when a rapidly fatiguing and sleep-inducing result is desirable.

But it must be always borne in mind that the immediate general result of the movement is heating, and it must be used and regulated accordingly. If there should be any inflammatory irritation in the region of the abdomen, or any tendency to loss of blood, and where there are abdominal ruptures, it must be altogether avoided; those of the female sex who are liable to agitations, and where a treatment is being followed of heating drink and bathing remedies, it must be used cautiously. By young girls it should only be practised exceptionally.

(33) **Settling Down** — 8, 16, 24 times up and down.

With the heels firmly set together the body should be kept upright, and first raised on the points of the feet, and then lowered as far as possible, then raised again, without separating the heels. At first it will be somewhat difficult to keep the body upright and not bend forwards, more or less in the endeavour to retain the balance. But with a little care and practice, this will be easily mastered. The stretching muscles of the knees, and those of the calves and toes, are chiefly used; although the lower muscles of the back are also well exerted to maintain the upright position of the body. The movement tends to free all the joints of the legs and feet; it is also a powerful restorative of vigour in paralytic conditions of the lower parts of the body, and for relieving the upper portion. As it indirectly stimulates the breathing consider-

Fig. 33.

ably, many will find it necessary to make short pauses while practising the second and third grades of the movement.*

We now come to a number of compound movements ; i.e., those which not being concentrated upon special parts, or separate divisions of the body, are more or less, and in diverse degrees, intended to set in play many, and some times all of the bodily powers at once.

(34) **Wand Circling** — 4, 12, 16 times back- and forwards.

A rounded wand will be necessary, which must be at least sufficiently long to reach from the ground to the armpit of the person exercising. The staff is grasped near the ends, the knuckles being upwards, and lifted vertically over the head in a circle, and then back again in such a fashion that the wand touches the front of the person and then the back when at its lowest point. An important point is, that the arms must not be bent at all at the elbows. This will be somewhat difficult at first, as most people are rather stiff in the shoulder-joints through infrequent use of them in a free

* By means of this exercise (one of the most vigorous) I have made experiments on myself (I am in the fifties) in order by gradually increasing the exercise to try how much the powers of the muscular tendons could, without any detriment, be possibly brought to perform ; always provided that the sum total of muscular activity for each day should not be exceeded by the addition of many other forms of exercise. For once I confined my daily allowance of gymnastics almost entirely to this movement ; and without perceiving the slightest inconvenience, I gradually reached on the tenth day three hundred repetitions of it ; of these I performed, with short breaks, one half in the morning and the other in the afternoon. Before this, although I was always muscular and in good training, if I had not performed this exercise for some time, I used to feel, after thirty repetitions, a sensation of overtiredness in the front muscles of the thigh the next day. If I had taken longer rests between the movements, I am convinced that I could have continued far beyond the three hundred times, with a like result. This will give some measure of the far-reaching effects of, and enable us to arrange the gradual increase in, these exercises so as to increase gradually our muscular powers without injury to the rest of the system.

and natural way; but this obstacle will gradually give way to practice, and in the same way the hands can be gradually brought closer, until the limit be reached, as shown in our illustration of the usual average position. With the back and forth movement of the wand the body is gently swayed backwards and forwards at the same time, thus making the movement a composite one. The chief effect is on the muscles of the shoulder, and next on the extensor muscles of the arms, and on the muscles of the back and stomach. The movement is the most efficient *for freeing the shoulder-joints;* it is also useful *in paralysis of those parts,* as well as for *rendering more efficient the breathing* and the *functions of the abdominal organs.*

Fig. 34.

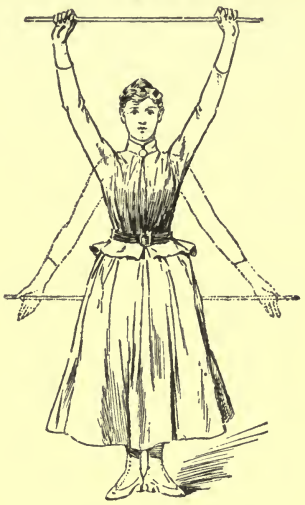


Fig. 35.

(35) **Walking with Transfixed Wand for** 5, 10, 15 minutes.

A short rounded wand or stick is passed across the back, through the arms bent at right angles, and pressed firmly back. In this position, while holding the body as upright as possible, a walk of the above duration is taken up and down the room. The important point is to keep the arms and shoulders constantly firmly pressed back, and the latter pressed down.

The wand will help to keep the back in its proper position, as well as the arms and shoulders, which without something to hold to is difficult for any length of time. The whole attention must be entirely concentrated on preserving the firm, upright bearing of the body while walking.

The aim of the movement, while assisting to strengthen the muscles of the shoulders, back, and feet, is to form and maintain a *habit* of carrying the body in a healthy and elegant position. It is, therefore, especially directed against the opposite habit of a humped, slack, and slovenly bearing of the shoulders, the back, and of all the body as a whole. These bad habits are especially common in children at the time when they are growing fast, and therefore have the most serious results (defects of figure, and faulty development of the organs of the chest) for the whole of the rest of their lives.

This movement has no further special use for curative purposes.

(36) **Swinging the Arms Forwards and Backwards** — 30, 60, 100 times each way (D).

The arms are moved vigorously forwards and backwards in a throwing or swinging movement with closed fists and loosely extended. The action will be fairly quick. The body does not remain stiff, but will be allowed to sway loosely from the hips, so that when the arms go forward, to maintain the equilibrium, the body will bend backwards, and when the arms go backwards the body will go forwards. By this the whole movement will be made easier and more complete, while the effect of it is further extended.

Besides this movement of the arm-and-shoulder muscles, most of those belonging to the abdomen and back are also

set in rhythmical activity; even the sensation immediately following this exercise is most agreeable. And its whole action, although vigorous, is yet of a soothing nature. It induces *a large amount of all-round activity*, and is a powerful *stimulant to the circulation over the whole body*. In *paralysis of the arm, back, and abdominal muscles*, and in *sluggishness or costiveness of the abdominal functions generally*, it is most useful in assisting special courses of treatment, and can be especially recommended on account of its agreeable and soothing action in certain cases, as well as for those beginning the practice of gymnastics. Although the movement, in spite of its setting the whole circulation in lively motion, cannot be considered as heating, yet at the same time it is a very good and thorough *method for getting warm, especially for the arms and the body*. It is also to be recommended as a means of refreshing any one who may be suffering from that physical or mental *lassitude* which is accustomed to creep over us now and then; as, for instance, in changes of the weather or seasons, or as a result of an occasional upset of the abdominal system of nerves, without any other explicable cause. In such cases the movements should be continued 200, 300, or 400 times, with short rests between, until at last we are enabled to get the better of this troublesome foe.

Fig. 36.

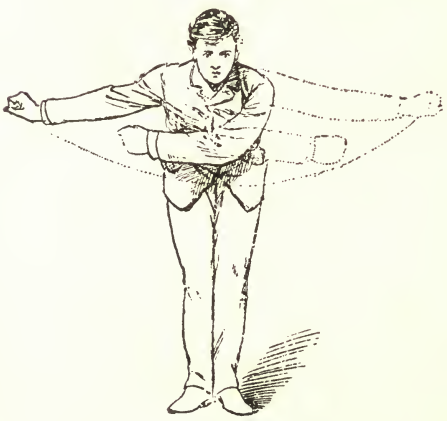
In cases where it is desirable to bring all the muscles of the body into still more vigorous action, and at the same time increase the stimulation of the system, the arms, instead of moving in the same direction, can be swung in op-

posed directions, the one backwards and the other forwards at the same time. This variation is also useful for rectifying *lateral curvatures*, and where *the axis of the spine is out of position*. It will then be carried out so that the emphasis of the movement is given with both of the arms in one direction alone; as, for instance, with the left backwards, with the right forwards, or *vice versa*, according to the nature of the disorder which it is desired to rectify.

(37) **Arm-Swinging Sideways** — 30, 60, 100 times each way (D).

A movement very similar to the foregoing one, being chiefly varied in the direction of the swing. The arms are moved sideways, though otherwise in exactly the same manner as before. But the upper part of the body is bent slightly forward, though only so much as to allow free play to the arms, which hang straight down, while they swing first to the right and then to the left in front of the body, which is allowed to move loosely from the hips in a similar rhythmical swing, and as before in an opposed direction to the arms, though sideways.

Fig. 37.



Besides the muscles which move the arms, all the side muscles of the abdomen are also here brought into play, so that the action of this movement is more effective in *stimu-*

lating the parts about liver and the spleen, and therefore intended more for *congestions of these organs*. Through the flexion of the body forwards, it is somewhat more effective for *strengthening the muscles of the back*. In other respects this exercise has the same properties and methods of use as the preceding one, as far as that is carried out by the arms moving in the same direction.

(38) **Sawing Movement** — 10, 20, 30 times with each arm backwards and forwards (D).

The body is bent well forwards, and while one arm is pushed vigorously forwards and downwards, the other is drawn with bent elbow backwards and upwards at the same time. The movement becomes at once easy if we think we are pushing with the one hand something vigorously from us, while we drag at the same time something equally vigorously towards us with the other.

Fig. 38.

By this means some very comprehensive groups of muscles are brought into play; nearly all those of the arms, shoulders, and back. The exercise is suitable for completing a *certain amount of all-round movements*, *against paralysis of the muscles used*, and through its rhythmically vibrating action upon the *organs of the chest and abdomen*, against such diseased conditions as arise from *congestions of the humours*, and *torpid action of these organs*.

(39) **Mowing Movement**—8, 16, 24 times back and forth. (D).

The arms must be held out horizontally, and kept constantly stretched out, and while the body and feet remain perfectly firm and steady, a horizontal half circle is described by moving both arms vigorously, first to the right and then to the eft. The emphasis of the movement must be given equally both right and left. It should be imagined that we are mowing first right and then left, and thus through the whole movement there is certain drawing and swinging.

Fig. 39.

As in the above manner of performing the exercise, the body is kept perfectly steady and upright, and therefore must offer a certain amount of resistance to the alternate swing of the arms to either side; in addition to the vigorous activity of the muscles of the shoulders and arms, all the muscles of the body, legs, and feet are brought into rhythmic, powerful tension. Thus the movement has an animating effect upon all the muscles which control all the members of the body, and is especially useful in *general muscular debility or paralysis, especially in incipient diseases of the spinal cord*, at that period of the disease when generally a certain sensation of numbness and an unaccustomed insecurity in the use of the feet begin to arouse the earnest attention of the sufferer.

This exercise may also be applied in cases of lateral curvature of the spine, with derangement of the spinal axis, when the stress of the movement should always be laid to the side opposite to the curvature.

(40) **Hewing Movement** — 6, 12, 20 times (D).

In this movement the legs are kept straight, and somewhat wide apart. The arms are raised straight up, and then they are brought down as if it were intended to split a log of wood lying between the feet with an axe held in the hands. For this reason the legs will be allowed to give a little at the knee-joints in order to allow perfect freedom in carrying out the exercise.

Fig. 40.

The muscles which raise the arms, all those at the front and back of the body, as well as nearly all those of the legs and feet, are here brought into full play, and *an activity* induced which is *both vigorous and fatiguing*. Owing to its special characteristics this exercise is doubly beneficial as a healing remedy: (1) as promoting the functions of the abdominal organs, if these should be generally *torpid or congested*, and for *reinvigorating the nerves of the spinal cord*, where there may be *incipient cases of disease;* and the exercise may be somewhat modified, according to the end to be attained.

In the first case, where it is desirable to stimulate the functions of the abdominal organs, the emphasis should be given

to the downward stroke of the arms and body, in the second to the uplifting movement. This exercise should not be used if there should be a predisposition to severe rushes of blood to the head and chest, and not at all by the female sex, for several reasons.

(41) **Trotting Movement on the Same Base**—100, 200, 300 times with each foot.

This is nothing but the ordinary movement of trotting, with this difference, that here no advance is made, but the same position is maintained throughout, so that the usual bending forward of the body when running at a trot is dispensed with, and the *points of the feet only* are employed. The reason of this last direction is that otherwise, when the whole under surface of the foot is brought down, the body is so severely jarred that an unpleasant, and for many persons a prejudicial, result is felt in the head. The joints of the knee and ankle must be kept pliable; for by this means only can we obtain that gentle and remedial concussion of the body, which should be kept in view almost as much as exercise for the legs and feet. The movement may be increased or relaxed at pleasure, as may be necessary, by increasing or lessening the spring upwards made by each foot.

Fig. 41.

This exercise is especially useful where it is required to procure *sleep or an agreeable feeling of tiredness;* to *mildly stimulate the circulation and evacuations, to relieve the head and chest, and in paralysis of the feet, or constant sensation of chilliness in the feet.* It is also useful in various distur-

bances of the monthly periods of women, where there is too slight evacuation of blood, though here naturally a doctor should always be consulted first.

(42) **Leg Waving Backwards and Forwards** } 8, 16, 24 times
(43) „ „ **Sideways.** } with each leg.

Fig. 42.

Fig. 43.

While standing on one leg, the other is raised about an inch above the ground, and swung or thrown vigorously back- and forwards, or from right to left respectively. The toes are pointed upwards. At first, until some practice in maintaining the balance has been obtained, a support (e. g., of a chair or table) will be necessary. But this support should be dispensed with as soon as possible, as otherwise much of the beneficial effect will be lost, for the endeavour to preserve the balance unaided and the body upright will demand much muscular activity, and is part of the purpose of the exercise. Both movements call especially into play the groups of muscles placed about the hips, both intensively

and extensively; their effects are also felt in all the muscles of the back up to the region of the nape of the neck, and in all those of the feet and legs; for even the leg which appears to be at rest has sufficient to do in order to maintain the equilibrium which is threatened from all points. Both exercises are very much to be recommended for *affections of the hip-joints* of a *chronic rheumatic or gouty, though not inflammatory*, nature, for *paralysis of the feet*, and as a means of *obtaining some general all-round exercise.*

(44) **Stepping over a Stick** — 4, 6, 8 times with each leg, backwards and forwards.

A straight stick or wand should be taken in the fingers of both hands, in such a way that the body may pass freely between them. Then, bending the body forwards, we must endeavour to step over the stick, without losing hold of it, keeping the thigh perpendicular to the stick as the step is made. When both legs have stepped over the stick forwards, the movement is repeated backwards. This exercise is certainly difficult; some can only perform it after continued practice, and some never can at all.

Fig. 44.

Apart from the unimportant movements connected with it, this exercise is centred in the muscles which raise the leg, and which are placed in the interior of the abdominal cavity, which by this means are contracted as much as possible. And thus the lower part of the intestinal canal, including the rectum and the hæmorrhoidal vessels, are most powerfully stimulated. The move-

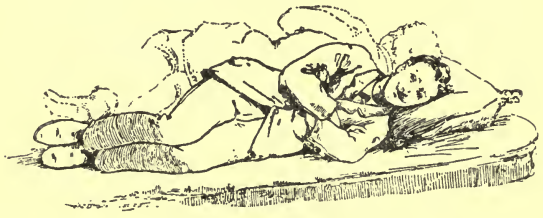
ments should therefore be experimentally included among the regular daily gymnastics, when there is *obstinate constipation arising in the lower intestinal canal, and where trouble is caused by the so-called blind hæmorrhoids*, — so long as there is no inflammation or irritation.

Should there be a predisposition to serious rushes of blood to the head, or in cases of rupture, this exercise is not to be recommended nor for the female sex.

(45) **Rolling on the Back** — 30, 40, 50 times back- and forwards.

A soft rug should be laid on the ground, which need not be longer than the body, with a cushion for the head; and on these the exercise is taken, lying down (at first) flat on

Fig 45.



the back. The arms are then crossed over the chest, the legs, half bent at the knees, rest with the heels on the ground.

The whole body now makes a simple rolling movement to one side, so that it rests on the arm, the shoulder, and the lateral bones of the hips, and then goes back to the opposite side with the same movement. The whole body must each time turn completely on to the side, so that with each movement an exact half-circle is described.

The purpose of the exercise is not so much muscular action, — for there is no special action here, it being quite unimportant, for which reason the movement has nothing exhausting or wearying about it, — but is rather a *rhythmically alternating displacement of the more movable interior organs, and especially of the intestines in the lower part of the abdomen.*

A displacement or rolling about of this kind can in simple fashion fulfil many medicinal purposes, or at least be of use in that respect, as all medical men know. On this account the movement can be recommended in all cases where it is desirable to cause the blood to flow more evenly through the system, as where it *requires to be prevented from overfilling and choking the internal organs of the abdomen*, where there are *hæmorrhoidal knots already formed, though not yet inflamed*, or *before the monthly periods of women where the pressure of too much blood in the abdominal organs gives reason to fear a too violent discharge, etc.; further in cases of inflations and collections of gas in the intestines* (*wind colic*), *and for attempts to bring back abdominal ruptures that have been pressed out of position.*

As this movement is only for such remedial measures as are requisite in certain special circumstances, it is not intended that it should form part of any regularly daily exercise, but that it should only be used when such cases for its occasional employment may arise.

V.

A Collection of Prescriptions to Serve as Examples for Special Treatments.

Preliminary Remarks.

I SHALL give in this section a number of special prescriptions for common maladies, which can be best treated by using the methods of medical home gymnastics, and thus facilitate and insure the proper adaptation of these gymnastic methods to the special cases which may arise in practice, as far as this is possible and attainable by general instructions. I trust that these will at least be of use as general models or indications for all other cases. But at the same time it must be remembered that these special instructions are only prescriptions for stated cases, and when they are to be put into practice must be always accommodated to the individual requirement, and generally need special medical supervision as well.

The right quantity and quality of the exercises for *each individual can only be ascertained by self observation.* It must also be remembered and clearly borne in mind that the prescriptions intended for special remedies are not to be regarded as if by their means everything could in every case be attained or healed, but that they only form an important part of the treatment which is generally necessary, and the most suitable way and method of applying and making use of the remedial power of movement for practical purposes. In the composition of the separate movements in these prescriptions the sequence is regulated with regard to

a suitable variation of muscular activity. For we must take care, in order to avoid over-stimulation, that the same groups of muscles should not come into play for too long at one time together. And on this account it will be advisable in cases where local disorders are being treated, not to confine the prescription too narrowly to the exercises directly recommended, and which are of direct value for them, but to bring in, between these, others of less importance, of indirect value, or it may be only to complete a suitable amount of general movement. It is also from this point of view that these specialized prescriptions are to be regarded as models, which may be generally followed for the same kinds of collective exercises. In order to facilitate and reduce the back-references in these prescriptions as much as possible, I have added once more to the separate movements (in brackets) the repetition numbers indicated when they were first described, while the illustrations are in a plate attached to the cover at the end of the book, and which can be easily laid open to assist the memory, until the separate exercises are fixed in the mind.

When there is a B printed after a movement it indicates (what was generally recommended on page 27), that an interval for deep breathing (6 or 8 times in succession) should be allowed there. This should never be omitted. A capital D means, as before, that dumb-bells may be used.

With regard to those prescriptions which are intended for special and local disorders, and in cases where for this reason the most important exercises are indicated more than once, as in the 1st, 4th, 5th, and 6th prescriptions, it is advisable, at the first commencement, to restrict oneself to the one performance of these movements, until the body, and especially the muscles called into play, become more accustomed to them through practice, and over stimulation need no longer be guarded against.

1. Prescription for Relieving the Head and Chest from Blood Pressure and from Chronic Pains and Inflammation.

Arm-twisting. Fig. 16 (30, 40, 50) D.

Figure-of-8 movement with the hand. Fig. 17 (20, 30, 40) D.

Finger bending and stretching. Fig. 18 (12, 16, 20) B.

Leg-circling. Fig. 25 (4, 6, 8).

Leg-raising sideways. Fig. 26 (6, 10, 16), not for the female sex.

Leg-twisting. Fig. 27 (40, 50, 60).

Hand-rubbing. Fig. 19 (40, 60, 80), modified as recommended in the description.

Leg-drawing together. Fig. 28 (6, 12, 16).

Knee- bending and stretching forwards. Fig. 29 (6, 8, 10).

Knee- bending and stretching backwards. Fig. 30 (10, 16, 20).

Foot- stretching and bending. Fig. 31 (30, 50, 60).

Settling down. Fig. 33 (8, 16, 24) B.

Leg-waving back- and forwards. Fig. 42 (8, 16, 24).

Leg-waving sideways. Fig. 43 (8, 16, 24).

Trotting movement. Fig. 41 (100, 300, 500) B.

Settling down. Fig. 33 (8, 16, 24).

If when this set of exercises has been gone through, its powerful effect for relief through increased warmth in the feet, etc., should in special cases still be insufficiently felt, then the simple plan of beating the feet may be tried as well. For this a short stout stick, or any piece of wood or other material, may be used, and each foot rapped with this alternately on the soles of the shoes and boots, until they are in a pleasant glow. When the feet remain at times persistently cold this is the most powerful and never-failing remedy.

2. Prescription for Promoting and Perfecting the Breathing Power, for Narrow Chests, and Incipient Tuberculosis of the Lungs, Asthma, and so on; Also for Strengthening the Voice of Preachers, Teachers, Singers, Stammerers, and Others.

Shoulder-raising. Fig. 3 (30, 40, 50).
Arm-circling. Fig. 4 (8, 12, 20) D.
Arm-raising sideways. Fig. 5 (10, 24, 40) B D.
Elbows backwards. Fig. 6 (8, 12, 16).
Hands clasped behind. Fig. 7 (8, 12, 16) B.
Arm-striking outwards. Fig. 10 (10, 20, 30) D.
Arm-striking upwards. Fig. 11 (4, 8, 12) D.
Body-bending sideways. Fig. 21 (10, 16, 24).
Throwing the arms outwards. Fig. 15 (12, 16, 24) D B.
Body-circling. Fig. 23 (6, 10, 16).
Wand-circling. Fig. 34 (8, 20, 30) B.

In the cases under this heading, where there is an unequal breathing capacity in the two sides of the chest, instead of the usual equal deep breathing, the *unequal* deep breathing described and illustrated on page 40, under Fig. 8, may be used in alternation with the other. In that form of asthma which consists in the lung-cells becoming relaxed and distended (emphysema), and which can be easily detected by a medico-physical examination, the expiration must be more emphatic than the inspiration in the deep breathings, whether these be equal or unequal. For this reason all modes of using the voice which involve forcible expiration, such as loud speaking, declamation, laughing, singing, especially voice carrying in singing, are very much to be recommended. But those persons who have suffered for some time seriously with chest complaints are here emphatically reminded to undertake nothing, not even the most simple exercise, without previously consulting their doctor.

3. Prescription for Torpid Action or Congestion of the Abdominal Functions Generally, and for those numerous Ailments which arise from these Causes, such as Overloading of the Veins of the Portal System, Weak Digestion, Habitual Constipation, and consequent Headaches, and Hæmorrhoidal Troubles, Hysterical Symptoms, Hypochondriacal and Melancholy Humours, and so on.

Body-bending back- and forwards. Fig. 20 (10, 20, 30).

Body-bending sideways. Fig. 21 (20, 30, 40).

Wand-circling. Fig. 34 (4, 12, 16) B.

Body-turning. Fig. 22 (8, 16, 24).

Knee-bending and stretching forwards. Fig. 29 (4, 6, 8).

Body-circling. Fig. 23 (8, 16, 30) B.

* Sawing movement. Fig. 38 (10, 20, 30).

Body-raising. Fig. 24 (4, 8, 12).

Leg-raising sideways. Fig. 26 (6, 10, 16), not for females.

* Hewing movement. Fig. 40 (6, 8, 12) B. Not for females.

Throwing the arms back- and forwards. Fig. 36 (20, 40, 60) D.

Knee-raising forwards. Fig. 32 (4, 10, 16).

Throwing the arms sideways. Fig. 37 (30, 50, 100) B.

Stepping over a wand. Fig. 44 (4, 6, 8), not for females.

Trotting movement without change of base. Fig. 41 (100, 150, 200) B.

The exercises marked with an asterisk *, in such cases as may be using this prescription with drinking- or bathing-cure, involving very stimulating or very heating drinks or

baths, should only practise the movement half the number of times indicated or even less. A useful method for promoting the functions of the bowels is *massage* or *kneading* of the abdomen. It is performed when the muscles of the stomach are resting, in a comfortable position on the back, at best in the morning in bed. The thumbs are placed close under the side of the ribs and far back, the other fingers are extended over the front surface of the soft exterior wall of the stomach, and then each hand alternately presses and kneads it for several minutes at a time. A still more powerful stimulant is exercised by the *concussion pressure*, in which both hands simultaneously compress the stomach with palms and fingers, and then being raised quickly and together a concurrent rebound of the elastic walls of the stomach, and the intestines which lie within it, will result. The most vigorous stimulant of all is the concussion caused by beating it for several minutes with clenched hands. When there are no inflammatory pains in the abdomen, such as cramps, wind colics, and so on, much alleviation is caused by simply rubbing the stomach with the surface of one hand on the naked skin, or the circular friction of the region of the navel, continued for five to ten minutes, and this is also useful, when regularly persisted in, for stimulating torpid action of the bowels. All those who suffer from sluggish circulation in the portal system of veins, should also practise constantly deep breathings, by which means those blood channels most subject to congestion are immediately pumped out into the lungs.

Those who suffer from chronic complaints of the bowels should also be careful as to what position they use in bed. To lie flat on the back is not only most beneficial for health on account of the greater freedom for breathing, but also because the abdominal organs are less liable to pressure, and the whole body does not so easily assume a curved posi-

tion as when lying on one side. Where those lateral organs, as the liver or the spleen, are constantly subject to chronic disorders, special care must be taken in the first case not to lie on the right side, nor in the second on the left. The same persons, if they are compelled to remain long in a sitting position, should avoid the habit of crossing one foot over the other.

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4. Prescription for the Immediate Relief of Constipation.

Arm-throwing back- and forwards. Fig. 36 (20, 40, 60).

Arm-throwing sideways. Fig. 37 (20, 40, 60) B.

Raising the body. Fig. 24 (4, 8, 12).

Sawing movement. Fig. 38 (10, 20, 30).

Body-circling. Fig. 23 (8, 12, 16).

Hewing movement. Fig. 40 (6, 8, 12) B. Not for the female sex.

Knee-raising forwards. Fig. 32 (6, 12, 20).

Arm-throwing back- and forwards. Fig. 36 (30, 60, 100).

Arm-throwing sideways. Fig. 37 (30, 60, 100) B.

Trotting movement on the same position. Fig. 41 (100, 200, 300).

Body-circling. Fig. 23 (8, 16, 30), to be modified as described before.

If the stools are too hard and dry, a simple injection of a sufficient quantity of warm water is the safest, quickest, and most advisable remedy. If there be any inflammatory hæmorrhoidal irritation connected with this, it is best to mingle a little sweet oil, such as linseed, with it. This will coalesce better with the water if the yolk of an egg be added.

5. Prescription for Hæmorrhoidal * Disorders, and Difficult Menstruations.

Mowing movement. Fig. 39 (6, 10, 16).

Arm-waving back- and forwards. Fig. 36 (20, 30, 50) D.

Arm-striking downwards. Fig. 12 (10, 20, 30). In this instance the blow may be somewhat violent, so long as it does not jar the head too much. D.

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* The expression hæmorrhoids has in daily life a too wide and undetermined meaning. First of all, the symptoms which go by the name of hæmorrhoids (formation of knots, dry irritation or bleeding from the seat) should be divided into two main divisions, according to their origin: (1) primary hæmorrhoids which are unconnected with any other traceable malady, and where, through general superfluity of blood (frequently often merely arising from a want of balance between the intake and outgo of material), or laxity of the coatings of the veins, the blood becomes congested, through the upright position of the human body, in the lower veins of the abdomen, and these therefore are called simply sinking hæmorrhoids; and (2) secondary hæmorrhoids, which are the outcome of some other diseased condition, and when the congestion of blood in the seat is caused by stoppage of the circulation, and functional disorders of other, frequently remote parts, such as the liver, spleen, heart, lungs, etc.

In both kinds of hæmorrhoids bleeding is caused by the bursting of the swollen blood vessels, which results in a decrease, and with the sinking hæmorrhoids, even in a complete disappearance for a long time of this troublesome disorder, and on this account many persons regard these so-called flowing hæmorrhoids as promoting the cure, and desirable. Even if this relief be admitted, yet the bleeding is less the forerunner of a cure than nature's way out of the difficulty; and every doctor will remember cases when too severe bleedings so weakened the patient, that recourse had to be taken to an operation for removing the bleeding vein knots. For it is better to deal with the disorders which precede the bleedings (such as a feeling of fulness in the bowels, irritation in the seat, evacuation of mucus, constipation, and so on), before it gets so far; and for this, beside other measures, gymnastic exercises are a means which cannot be valued too highly, and then if a bleeding takes place, so long as it does not assume a serious character, as may be gathered from the above, it is rather desirable than critical.

But if there are violent bleedings and inflammatory symptoms, all exercises must be put aside. Rest is here necessary, but chiefly medical advice as to what may be suited to the case. The doctor should also be consulted when the monthly courses of women are delayed. For instance, it would be a great mistake in cases where the lack of menstruation is to be attributed to extreme poverty of blood in a female body to attempt to force on the deficient periods by the above exercises; while on the other hand, with otherwise healthy women, when the periods are delayed by violent mental disturbances, or a chill, these exercises are of great use.

Trotting movement on the same base. Fig. 41 (100, 150, 200) B.

Sawing movement. Fig. 38 (10, 20, 30).

Knee-raising forwards. Fig. 32 (4, 8, 12).

Arm-waving sideways. Fig. 37 (20, 30, 50).

Stepping over a stick. Fig. 44 (4, 6, 8) B. Not for females.

Leg-waving sideways. Fig. 43 (8, 16, 24).

Knee-raising forwards. Fig. 32 (4, 8, 12).

Trotting movement on the same base. Fig. 41 (150, 200, 300).

Stepping over a stick. Fig. 44 (4, 6, 8). Not for females.

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6. Prescription for Unhealthy, Weakening Frequency of Pollutions.

Arm-circling. Fig. 4 (8, 12, 20) D.

Arm-raising sideways. Fig. 5 (10, 20, 30) D.

Elbows backwards. Fig. 6 (8, 12, 16).

Arm-striking forwards. Fig. 9, (10, 20, 30) D.

„ „ outwards. „ 10, , „ „ „

„ „ upwards. „ 11, (4, 8, 12) B D.

Hewing movement. Fig. 40 (6, 12, 20). [Emphasis on the upward stroke.]

Sawing movement. Fig. 38 (10, 20, 30) D.

Striking the arms together. Fig. 14 (8, 12, 16) D.

Throwing the arms apart. Fig. 15 (8, 12, 16) D.

Settling down. Fig. 33 (8, 16, 24).

Mowing movement. Fig. 39 (8, 16, 24) B.

Hand rubbing. Fig. 19 (40, 60, 80).

Hewing movement. Fig. 40 (6, 12, 20). [As above.]

Arm-waving sideways. Fig. 37 (30, 60, 100).

Sawing movement. Fig. 38. (10, 20, 20) B.

When such cases as these are persistent, it is also advisable before going to bed (and therefore in every case, some time after the exercises, which should generally never be performed later than before the evening meal) to take a hip-bath of a temperature between 54 and 60 Fahr., and lasting from 6 to 8 minutes, or a simple injection of the same temperature, which should be retained as long as possible, and therefore not too abundant; and at night, in this case, as an exception, instead of lying on the back, make a habit of lying on each side alternately; and in the morning, not at night, wash the parts about the sexual organs and the perinæum with cold water.

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7. Prescription for Strengthening Treatment where there is a Tendency to Rupture, and for Abdominal Ruptures in Young Persons, especially Inguinal Rupture (Hernia Inguinalis).

Body-bending back- and forwards. Fig. 20 (10, 20, 30).
Striking the arms backwards. Fig. 13 (8, 12, 20) D.
Raising the body. Fig. 24 (6, 10, 16).
Mowing movement. Fig. 39 (8, 12, 20).
Body-turning. Fig. 22 (10, 20, 30).
Arm-waving back- and forwards. Fig. 36 (30, 60, 100) D.
Body-raising sideways. The position is similar to that in Fig. 24, only that the body is raised with a turn of the eighth part of a circle * (4, 6, 8 times with either side).

* While lying down on the back in the middle of a room, a side-turn is made with the body in such a way that the front part of the body is turned exactly towards the cornice of the ceiling, either right or left; i. e., a turn of half a right angle; and the body thus turned is then raised to an upright sitting position. In this manner, the movement employs as fully as possible those fleshy and sinewy fibres of the abdominal muscles (*obliquus abdominis externus*, and *internus*, and *transversus abdominis*), whose powers of contraction determine the healing of the rupture; that is, of the *hernia inguinalis*. This prescription can be also recommended against *hernia umbilicalis, and h. lineæ albæ*, with the difference that in these cases the raising the body sideways is not used.

But this exercise is not for the commencement of the treatment, and should only be used with the others when the simple body-raising (Fig. 24) becomes easy through practice.

The following instructions should be carefully observed: (1) The treatment should *never* be commenced without being assured that it is safe by a medical opinion on the condition of the rupture. (2) During the exercise, the truss must completely retain the rupture in position. If the rupture cannot be completely retained, the treatment must not be attempted. (3) The most careful attention must be given to carry out the movements *exactly* and *smoothly*, without any sudden stops, and also according to the general rules laid down. (4) The movements should be always carried out equally by both sides of the body, as in the illustrations, even when it is a simple rupture on one side only. For when once a rupture has occurred, there is nearly always a disposition towards another one arising on the other side. For this reason a rational healing treatment demands an equal strengthening of both sides of the walls of the abdomen. (5) The treatment should be continued without a break for 6 or 8 months. (6) After three months the amount of movements which have been progressively arrived at may be performed twice daily. (7) For young persons, or for those who are not yet passed middle age, when the rupture is not serious, there is always a hope that the treatment will work a complete cure. (8) If this be attained, then precaution should be taken against return of the evil by performing these exercises at least twice weekly; this is very good, too, for the general health, while the truss can be gradually left off. (9) For the far less usual ruptures of the thigh (*hernia femoralis*, and for *hernia* foram. obturat.) the treatment cannot be used.

8. Prescription for Incipient Muscular Paralysis.

As muscular paralysis may present itself for medical treatment under as many forms and kinds as may arise from the variety of muscles in the human body, it will not be expected that I should specially consider these conditions here, as this would be far beyond the limits and purpose of this treatise. It will suffice to outline some general method from which schemes of treatment may be drawn up for all the individual cases of this kind which may come under medical observation. This I shall endeavor to give in the two following prescriptions, one being intended for simultaneous paralysis of the arms, the other for the same in the legs. In cases where only single muscles or groups of muscles are attacked with paralysis, the prescribed gymnastics should be so modified that those movements which bring the diseased muscles into play should be gradually increased to 3 or 4 times their usual quantum, while the other complementary exercises are proportionately decreased. This should be the rule in paralysis of one side only, when those movements which are suited to the case, and can be carried out by the muscles of that side, should be increased for the side which is diseased, while the similar movements for the side which is healthy should be proportionately lowered. When medicinal gymnastic movements are used for paralysis, it is more important than in all other forms of disease that they should be carried out with unremitting attention, and with the fullest exertion of will power. For on this will depend the restoration of the muscular nerve force which has been lost. If the paralysis has advanced so far that the will has no further power, and all motor force is gone, the patient may attempt to go through some of the movements with the help of another person, and so perhaps gradually recover the active use of his limbs.

The healing treatment to be pursued for paralysis is rendered much more efficient by the use of some mechanical action. This will consist, according as the muscles involved are more accessible and more suitable for one or the other form of treatment, in a vigorous gripping, kneading, striking with the edges of the hand, striking with stiff outstretched fingers, and soft stroking with the palm of the hand. These last should always be in the direction of the heart in order to correspond with the circulation. It is a good plan to take this massage or rubbing treatment immediately before the exercises, in order that its restorative and energising influence may give the necessary stimulus for carrying out the movements with vigor. It may be taken, too, several times daily, so long as it produces no painful sensation.

(a) Against Incipient Paralysis of the Arms.

Shoulder-raising. Fig. 3 (30, 40, 50) D.
Arm-circling. Fig. 4 (8, 12, 20) D.
Arm-raising sideways. Fig. 5 (10, 20, 30) D. B.
Elbows backwards. Fig. 6 (8, 12, 16).
Hands clasped behind. Fig. 7 (8, 12, 16).
Sawing movement. Fig. 38 (10, 20, 30).
Arm-striking forwards. Fig. 9 (10, 20, 30) D.
„ „ outwards. „ 10 (10, 20, 30) D. B.
„ „ upwards, „ 11 (4, 8, 12) D.
„ „ downwards, „ 12 (10, 20, 30) D.
„ „ backwards, „ 13 (6, 10, 16) D. B.
Arm-twisting. Fig. 16 (30, 40, 50) D.
Figure-of-8 movement with the hands. Fig. 17 (20, 30, 40) D.
Finger-bending and stretching. Fig. 18 (16, 24, 40).
Hand-rubbing. Fig. 19 (50, 80, 100) B.

(b) Against Incipient Paralysis of the Legs.

Leg-circling. Fig. 25 (4, 6, 8).

Leg-raising sideways. Fig. 26 (6, 10, 16). Not for females.

* Leg-twisting. Fig. 27 (20, 30, 40).

Drawing the legs together. Fig. 28 (4, 6, 8) B.

* Knee-stretching and bending forwards. Fig. 29 (6, 8, 10).

* Knee-stretching and bending backwards. Fig. 30 (10, 12, 16).

* Foot-stretching and bending. Fig. 31 (20, 40, 60).

Settling down. Fig. 33 (8, 16, 24) B.

Raising the body. Fig. 24 (4, 6, 8).

Mowing movement. Fig. 39 (10, 20, 30).

Hewing movement. Fig. 40 (8, 16, 24). Emphasis on the lifting movement. Not for females.

Trotting movement on the same base. Fig. 41 (100, 200, 300).

Leg-waving back- and forwards. Fig. 42 (8, 16, 24).

* Leg-waving sideways. Fig. 43 (8, 16, 24) B.

In cases where it is difficult to stand upright the movements marked with an asterisk may be more easily taken lying on the floor and then slightly raising the leg.

For most sufferers from paralysis it will be advisable to perform these or similar daily exercises, at any rate at first, with long rests between each, or divided out over different parts of the day, and even to pause when they require it between the repetitions of the separate movements. For in these cases special precautions should be taken against overstimulation of the nerves and muscles brought into activity, the possible result of too violent a procedure.

9. Prescriptions for such Cases where there is no Local Disorder to be Healed, but where the Whole Constitution has to be Built Up and kept in a Healthy State, by Providing a Suitable Amount of All-round Exercise, such as General Muscular and Nervous Weakness, Poverty of Blood, Anæmia, Scrofulous Complaints, Gouty or Rheumatic Disorders, Obesity, and for all Persons who do not as a Rule take much Exercise.

(a) For Adult Males.*

Arm-circling. Fig. 4 (8, 12, 20) D.
Striking the arms forwards. Fig. 9 (10, 20, 30) D.
„ „ „ outwards. „ 10 (10, 20, 30) D.
„ „ „ upwards. „ 11 (4, 8, 12) D. B.
Body-circling. Fig. 23 (8, 16, 30).
Hand-rubbing. Fig. 19 (40, 60, 80).
Body-raising. Fig. 24 (4, 8, 12).
Leg-raising sideways. Fig. 26 (6, 10, 16) B.
Drawing the legs together. Fig. 28 (4, 6, 8).
Foot-stretching and bending. Fig. 31 (20, 30, 40).
Sawing movement. Fig. 38 (10, 20, 30).
Knee-raising forwards. Fig. 32 (4, 8, 12) B.
Arm-waving back- and forwards. Fig. 36 (30, 60, 100) D.
Settling down. Fig. 33 (8, 16, 24).
Arm-waving sideways. Fig. 37 (30, 60, 100) B.
* Hewing movement. Fig. 40 (6, 12, 20).
* Trotting movement on the same base. Fig. 41 (100, 200, 300).

* The series of exercises which is drawn up here, if gradually increased according to the prescriptions to the third number of repetitions, takes about half an hour to complete ; and apart from the beneficial effects of its all-round character, is, in regard to the total amount of muscular activity developed by it, equal to a four or five hours' walk, and therefore saves a valuable amount of time, while it is less fatiguing on account of the various muscles exercised consecutively, and so fulfils better from all points of view the healthy purposes of exercise. In order that it may be interesting and agreeable as well, I would strongly recommend it to be carried out with suitable and pleasant companions.

Mowing movement. Fig 39 (8, 16, 24) B.
Leg-waving back- and forwards. Fig. 42 (8, 16, 24).
Leg-waving sideways. Fig. 43 (8, 16, 24).

(b) For Adult Females.*

Arm-circling. Fig. 4 (4, 6, 10).
Arm-raising sideways. Fig. 5 (5, 10, 15).
Hands clasped behind. Fig. 7 (4, 6, 8).
* Body-bending back- and forwards. Fig. 20 (5, 10, 15).
Arm-striking forwards. Fig. 9 (5, 10, 15) B.
„ „ outwards. Fig. 10 (5, 10, 15).
* Body-bending sideways. Fig. 21 (10, 15, 20).
Arm-waving back- and forwards. Fig. 36 (15, 30, 50).
Knee-stretching and bending forwards. Fig. 29 (3, 4, 5).
„ „ „ „ backwards. Fig. 30 (5, 6, 8).
* Body-turning. Fig. 22 (5, 10, 15).
* Sawing movement. Fig. 38 (5, 10, 15).
* Drawing the legs together. Fig. 28 (2, 3, 4).
Arm-waving sideways. Fig. 37 (15, 30, 50).
Foot-stretching and bending. Fig. 31 (10, 15, 20) B.
* Mowing movement. Fig. 39 (4, 8, 12).
* Settling down. Fig. 33 (4, 8, 12).

The exercises marked thus * should not be used on the days of the monthly periods.

(c) For Persons Over 60 Years, of Both Sexes.†

Arm-circling. Fig. 4 (4, 6, 10).
Leg-circling. Fig. 25 (2, 3, 4).

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* Regular muscular activity is most especially necessary for the female sex at the time of life when those monthly periods disappear which used to compensate many wants and faults in their way of life. Most of the sufferings and dangers of this transition period will be thus diverted by natural means, and the downward steps of life will be bright and cheerful.

† Even old age needs all-round movements. For only those who use their motive powers *suitably* can enjoy and retain the use of them,—a most important

Striking the arms together. Fig. 14 (4, 6, 8) B.
Throwing the arms apart. Fig. 15 (4, 6, 8) B.
Body-bending back- and forwards. Fig. 20 (5, 10, 15).
Hand-rubbing. Fig. 19 (20, 30, 40).
Leg-twisting. Fig. 27 (10, 15, 20) B.
Arm-striking outwards. Fig. 10 (5, 10, 15).
„ „ downwards. Fig. 12 (5, 10, 15).
„ „ backwards. Fig. 13 (3, 5, 8) B.
Settling down. Fig. 33 (4, 8, 12).
Arm-waving back- and forwards. Fig. 36 (15, 30, 50).
Body-bending sideways. Fig. 21 (10, 15, 20) B.
Sawing movement. Fig. 38 (5, 10, 15).
Arm-waving sideways. Fig. 37 (15, 30, 50).
Trotting movement on the same base. Fig. 41 (50, 100, 150) B.*

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factor in the whole process of living. It is a mistake for elderly persons to imagine that they preserve their lives by resting as much as possible. It is true that they must no longer make the same severe demands on their bodily powers as when in full strength, while they need longer periods of repose. But if they would keep off death and the decay of their powers as long as possible, a certain amount of regular and all-round activity must be kept up, while at times this amount should be somewhat increased, say once a week a larger, perhaps a double, quantity of the daily exercises. In fact, it is now that the rejuvenating effect of these movements is most especially necessary, for it will be easily understood that there is a greater liability to torpor and congestion of all the functions of the body. The life story of all those who have reached extreme old age clearly proves this. (Note especially what has been said under Rule 8, page 28.)

* The following practice may be generally recommended as of great value in preserving sound health and a longer duration of life as well. Each day so long as one is in good health, and in old age twice or thrice weekly, a cold water rubbing should be taken the first thing in the morning immediately after getting up. For this purpose a flat bath with only about one inch of water in it is used; this should be as cold as may be suitable for the individual constitution (not under 59 Fahr., and not over 73 Fahr.); and it will be better for weakly or nervous persons to attempt the lower temperatures very gradually. A beginning is best made with a temperature of 86 Fahr., — the slight trouble of measuring this is well repaid by the beneficial effects produced, and then every second day one degree colder may be tried, down to, but not below, 68 degrees, and in old age, 72 degrees. The temperature of the room should not in these cases be lower than 66–68 degrees. It is also a good plan, at any rate at the commencement, to have the rubbing done by some one

At this point we may discuss somewhat more fully that nervous weakness, or neurasthenia which may well be called "the malady of the nineteenth century."

If this be a product of our times, or whether earlier times have also produced nervous people, we need not consider, and still less whether we should hold this malady to be chiefly caused by some hereditary complaint handed down by our forefathers, or by some premature and altogether unsuitable strain on the entire organism, for which our present-day life has only too many inducements. And finally we will leave also undiscussed whether the weakness and irritability of the central nervous system and the insufficient control which it will therefore possess over the nervous channels of the circulation, or, on the other hand, the disturbances of the vessels of the nerve-centres, and the consequent insufficient nutrition of the brain and spinal cord, are the primary causes of the various forms of this complaint. To-day it gives rise to apparently the most serious and troublesome symptoms in one part of the body, to-morrow it attacks another, and the first is restored to a normal condition. The patient, in the conviction that he will be told of some incurable complaint, is induced to pay his doctor numberless visits, till he leaves him comforted, or else annoyed by his unbelief. Then, as his anxiety gradually diminishes, he will begin to support his fate with greater calmness, though at last he becomes the prey of constant restlessness, and makes his friends quite uncomfortable, while they, by

else. The rubbing down is given with a doubled towel of coarse linen, dipped in the water, slightly wrung out, and then rubbed over the whole body, from the head downwards. This is the best way of combining washing and rubbing down in one quick procedure. Then the whole surface of the body is dried with a kneading, and for the bony parts, not excepting the head, a patting movement. After having put on some necessary clothing the selected series of gymnastics should now be gone through, and the refreshing and restorative effect of this procedure, which is suitable for all periods of life, will encourage every one who has tried it once to keep up the practice of it.

their impatience and contemptuous treatment, help to increase the suffering which the poor man really undergoes, though he may unduly exaggerate it.

But here we are chiefly concerned with the appearance of the symptoms, with the best manner of treating them. No one will doubt that many people are nervous without knowing it, while others attempt to support their nervous sensations with energy and courage; but they both will be most severely tried when the symptoms of nervous circulation become really marked. And there are few who, sooner or later, are not compelled to seek medical advice for these most painful of all symptoms of disease. Whether it be violent palpitation of the heart, or fits, like fainting, or severe pains (præcordial pains, angina pectoris), or sparks in the eyes and singing in the ears, dizziness and piercing pains in the head, sensations of burning and chilliness, with a host of different species of melancholy, sooner or later some of them will appear. And what is their chief complaint? It is the tormenting restlessness which they continually experience, and which finds expression in every symptom. The restlessness which renders it impossible for them to keep their limbs still, or to remain in a fixed position for any length of time; which robs them of sleep, or awakens them out of their broken slumbers in a fright, and compels them to wander restlessly through their houses at night, and drives them into the open air by day; in short, the want of rest which they seek to escape from by restless action. This method of remedying it is, to my mind, an instinctive attempt of the sufferers from this malady to seek for recovery and restoration to health.

It is generally known that the distribution of the blood into its vessels cannot be directly influenced by the will. Involuntary blushes have many a time been a source of trouble to youthful maidens, and how mortifying it is for a man when his white cheeks betray the sensation of his

heart! But although our energies are powerless to control the circulation of the blood through the body, we can still influence it indirectly by the means of movement. Most people know that when the blood has risen to the head, they can obtain relief by a walk in the fresh air. And if the hands and feet are chilly in cold weather we endeavour to increase the circulation by rubbing and running. Thus it would appear that even the unmethodical and overstimulated activity of nervous people is an unconscious endeavour on their part to regulate the irregular circulation of the blood. But it will not be attained by such methods, which frequently lead to over-strain, and are not unattended with danger.

Yet it is an indication of the path we should pursue in order to overcome these evils. And while irregular, hasty, and one-sided movement is useless, methodical, gradually progressive, and precise exercise of all the muscles is the principal factor in the mechanical control of the circulation. On account of the importance of this, I have selected here those forms of movement which are of the greatest benefit in the various nervous disorders; though I must not omit repeating again that the selection and the duration of the exercises is best decided upon under medical advice, and in particular cases it is also best to consult a doctor whether in addition still further measures, such as baths, cold lavations, massage, change of air, or alterations in the mode of living, should be taken. The use of dumb-bells is only to be advised for nervous patients with precaution.

Head-circling. Fig. 1 (10, 20, 30).
Head-turning. Fig. 2 (6, 8, 10).
Elbows backwards. Fig. 6 (8, 12, 16) B.
Hands fast behind. Fig. 7 (8, 12, 16).
Knee-stretching and bending. Fig. 30 (10, 12, 16).
Foot-stretching and bending. Fig. 31 (20, 30, 40).

Arm-twisting. Fig. 16 (20, 30, 40).
Figures-of-8 with the hands. Fig. 17 (20, 30, 40).
Finger-bending and stretching. Fig. 18 (12, 16, 20) B.
Body-circling. Fig. 23 (8, 16, 30).
Leg-circling. Fig. 25 (4, 6, 8).
Leg-twisting. Fig. 27 (20, 30, 40).
Arm-waving back- and forwards. Fig. 36 (15, 30, 60).
Hand-rubbing. Fig. 19 (40, 60, 80) B.
Knee-stretching and bending. Fig. 29 (6, 8, 10).
Knee-raising forwards. Fig. 32 (4, 8, 12).
Trotting movement. Fig. 41 (100, 150, 200)

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10. Prescription for Promoting the Normal and Perfect Development of the Whole Body for Children of both Sexes, and for Cases of Lateral Spinal Curvature (one shoulder higher than the other).

As soon as children are four or five years old they may generally be considered fit to practise these exercises regularly. And specially it would be most advisable for educational institutions,* gymnasiums, kindergartens, etc., to

* At this point I feel I must offer some friendly advice from a medical point of view, to those who are in charge of schools to lay to heart. If our schoolmasters would exercise the very necessary precautions that children should hold themselves properly, and become well developed and healthy, under our present educational system, they should always make it a rule, that no child shall remain sitting or mentally occupied for more than two hours at a time. If a sitting posture be maintained without change of position (for even a change of place is refreshing) until the back becomes weary, it becomes one of the commonest causes among children of malformations of the spine and pelvis, and thus will have a most dangerous influence on the future of young girls. The continuous mental strain, too, is manifestly exhausting for children. The usual methods in schools for passing the ten minutes or quarter of an hour's interval, cannot satisfy those considerations for health which we have now in view. For this want can only be met on such occasions by some form of bodily activity which will restore the balance between body and mind. I would therefore suggest, that it will best agree with the general pur-

make some work of this kind form part of their regular curriculum. If such systematic exercises are carried on throughout the years of child life, it will be sufficient to perform them on an average about twice a week, and some part of them might be added on any days when the children could not otherwise take sufficient exercise. But it will be necessary that some grown-up person (father, mother, teacher, or governess) should either take part in and lead the exercises, or else watch the children carefully all the time they are engaged in them, in order that they may be performed properly.* Otherwise, in the long run, the children will not be serious about them; they will gradually relax their efforts, or make a game of them.

It will be the instructor's duty to keep the children interested in them (by timely changes or by combining and diversifying the movements); for the exercises only produce their full beneficial effect when they are performed with the whole power of the will. It is also important that the children should, from the first, acquire the habit of performing the exercises in a *perfectly even manner;* i. e., that the movements should be conscientiously and exactly carried out with the same frequency and with equal energy by the muscles of the right and by those of the left side. The eye of the director will soon acquire sufficient judgment for this. Nearly every one is more or less one-

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poses and conditions of school life, if, whenever lessons have been continued for more than two hours, the quarter of an hour's interval be occupied with the performance of some regular movements of different kinds, to be chosen from the lists here drawn up, and this might be carried out either in- or outside the class-rooms. Every ordinary teacher, whether acquainted with gymnastic exercises or not, will be able to conduct these, instead of the usual inspection or drill. And after such a refreshing break they will come back ready for work, and with much better results from every point of view. Besides this, physical culture is the foundation of mental culture, and, therefore, also an important part of school education.

* There are few better ways of spending an hour once or twice in the home circle.

sided from habit, and uses his weaker side less on this account in exercise, often unconsciously. This is a fault of physical development which is of great importance in childhood, because during this time of growth before them many a defect and imperfection in the future development of their frames will easily arise in this way. That form of spinal curvature which is commonly known as "one shoulder higher than the other" especially, and very easily arises when an unequal growth of the vertebræ is combined with a one-sided development and growth of the muscular system. If this defective growth has already commenced, gymnastic exercises will be all the more necessary, and those should be especially insisted upon, among the following movements for children, which are more suitable for this purpose than the rest, though they should not be used to the exclusion of the others. But in most cases some further orthopædic treatment will be necessary, such as the wearing of suitable straps or irons, or the practice of some reduplicated active movement, and massage under some conditions, or electricity after careful personal examination by a medical man.

Where the chief object is to develop the body as perfectly as possible, i. e., so that the movements of the limbs may be as free and as much as possible under the control of the will, as in ordinary dancingl essons, military exercises, etc., this will be best attained by allowing two or three or more of the simple forms of the exercises given here to be combined together, and with an intelligent instructor these movements may be diversified indefinitely. Though at the same time it is important that each separate movement should be carried out precisely and smoothly. Girls should not do those movements marked thus *.

Head-circling. Fig. 1 (5, 10, 15).
Head-turning. Fig. 2 (3, 4, 5).

Shoulder-raising. Fig. 3 (10, 15, 20).†
Arm-circling. Fig. 4 (4, 6, 10).
Arm-raising sideways. Fig. 5 (5, 10, 15).†
Elbows backwards. Fig. 6 (4, 6, 8).
Hands fast behind. Fig. 7 (4, 6, 8) B.†
Arm-striking forwards. Fig. 9 (5, 10, 15).
„ „ outwards. „ 10 (5, 10, 15).
„ „ upwards. „ 11 (2, 4, 6).
„ „ downwards. „ 12 (5, 10, 15).
„ „ backwards. „ 13 (3, 5, 8) B.
Leg-circling. Fig. 25 (2, 3, 4).
* Leg-raising sideways. Fig. 26 (3, 5, 8).
Striking the arms together. Fig. 14 (4, 6, 8).
Throwing the arms apart. Fig. 15 (4, 6, 8) B.
Body-bending forwards and backwards. Fig. 20 (5, 10, 15).†
Body-bending sideways. Fig. 21 (10, 15, 20).
Arm-twisting. Fig. 16 (15, 20, 25).
Figure-of-8 movement with the hands. Fig. 17 (10, 15, 20).
Finger-bending and stretching. Fig. 18 (6, 8, 10).
Leg-twisting. Fig. 27 (10, 15, 20).
Drawing the legs together. Fig. 28 (2, 3, 4) B.
Body-turning. Fig. 22 (5, 10, 15).†
Knee-stretching and bending forwards. Fig. 29 (3, 4, 5).
„ „ „ „ backwards. Fig. 30 (5, 6, 8).
Foot-stretching and bending. Fig. 31 (10, 15, 20).
* Knee-raising forwards. Fig. 32 (2, 4, 6) B.
Body-raising. Fig. 24 (2, 4, 6) B.
Mowing movement. Fig. 39 (4, 8, 12).†
* Hewing movement. Fig. 40 (3, 6, 10).†

† Specially suited for cases of spinal curvature with twisted axis (one shoulder higher than the other). When the opportunity for deep breathing is taken here, exercise No. 8 should be always used, and the hand pressed against that side which is higher. It is also always indicated if the movements should be on one side, and whether right or left, in the illustrations in the 4th part.

Settling down. Fig. 33 (4, 8, 12).

Wand-circling. Fig. 34 (2, 6, 8).

Walking with wand through the elbows. Fig. 35 (for minutes, 5, 8, 10).†

Throwing the arms back- and forwards. Fig. 36 (10, 15, 20).†

As the body, during the whole period of growth, does not yet possess that muscular strength which in adults can be exercised for longer continuous tasks, it is more in need of rest after active exertion. The children should, therefore, be allowed, each time that these exercises have been performed, to rest for about a quarter of an hour lying flat on their backs; they will then derive twice as much benefit from them.

And if all possible care is to be taken that children should hold themselves well, and grow up to full development, a similar rule should always be observed when they are compelled to sit upright during school hours. For if a quarter of an hour's rest (if only by leaning backwards), be allowed the children from time to time during these long hours of continuous sitting, the teachers will have more influence when they ask them to keep upright, during the time they are no longer under their control. And, besides, the other is an impossible demand.

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11. A List of such Movements as may be Performed while Sitting or Lying Down, to be used at choice by those who are Infirm or Paralysed. With each of the Movements an Indication is given how they are best carried out, either Lying (L), or Sitting (S).

Head-circling. Fig. 1 (10, 20, 30) S.

Head-turning. Fig. 2 (6, 8, 10) S.

Shoulder-raising. Fig. 3 (30, 40, 50) S.

† See Note, p. 94.

Arm-circling. Fig. 4 (8, 12, 20) S.

Arm-raising sideways. Fig. 5 (10, 20, 30) S.

Elbows backwards. Fig. 6 (8, 12, 16) S.

Deep-breathing. See page 40 and Fig. 8. S.

Striking the arms forwards. Fig. 9 (10, 20, 30) S. and L.

„ „ „ outwards. Fig. 10 (10, 20, 30) S. and L.

„ „ „ upwards. Fig. 11 (4, 8, 12) S.

Striking the arms together. Fig. 14 (8, 12, 16) S. and L.

Throwing the arms apart. Fig. 15 (8, 12, 16) S. and L.

Arm-twisting. Fig. 16 (30, 40, 60) S. and L.

Figure-of-8 movement with the hands. Fig. 17 (20, 30, 40) S. and L.

Bending and stretching the fingers. Fig. 18 (12, 16, 20) S and L.

Hand-rubbing. Fig. 19 (40, 60, 80) S. and L.

Body-bending back- and forwards. Fig. 20 (10, 20 30) S.

Body-bending sideways. Fig. 21 (20, 30, 40) S.

Body-turning. Fig. 22 (10, 20, 30) S. and L.

Body-raising. Fig. 24 (4, 8, 12) L.

Leg-twisting. Fig. 27 (20, 30, 40) S. and L., with slightly raised leg.

Drawing the legs together. Fig. 28 (4, 6, 8) S. and L., with the legs raised up.

Knee-stretching and bending forwards. Fig. 29 (6, 8, 10) S., with leg at right angles. L., with leg raised a few inches.

Foot stretching and bending. Fig. 31 (20, 30, 40) S. and L., with leg slightly raised.

Knee-raising forwards. Fig. 32 (4, 8, 12) S. L.

Wand-circling. Fig 34 (4, 12, 16) S.

Sawing movement. Fig. 38 (10, 20, 30) S.

Mowing movement. Fig. 39 (8, 16, 24) S.

Throwing the leg sideways. Fig. 43 (8, 16, 24) L., with leg slightly raised.

Rolling on the back. Fig. 45 (30, 40, 50) L.

In order to determine the value of the benefits derived from the movements carried out in a sitting or recumbent position, it should be remembered that there is not so much demand made upon those muscles of the back, legs, and feet, which are brought into play when the exercises are performed standing.

Concluding Remarks.

Beside those special uses here indicated, there will be many other healthful purposes to be attained in this way, and many most welcome and important results may be attained besides. There will be among others the pleasure of refreshing sleep, a more healthy and vigorous appetite, a certain bright and serene enjoyment of life, a feeling of contentment with oneself, as of having done a good action. Then the changes of the seasons will not be so much felt; there will be increased powers of resistance for epidemics, as for all the other moral and physical ills that beset us. We shall have greater control over our bodies, with a wider reaching activity, and generally much increased powers and endurance in all muscular exertions, with larger breathing capacity. These will afford a most wholesome means of diverting us and preserving a proper physical equilibrium when engaged in severe mental labours. If we have given way to excess in diet or in other directions, the lesser or greater evils which follow these can be more easily remedied, and the infirmities of advancing old age be deferred.

So that the young, and even more the old, will thus have a safe means of testing themselves from time to time as to whether they still possess perfectly normal freedom and ease of movement in all their limbs, and with this, full activity and capability for work. And if in any direction there

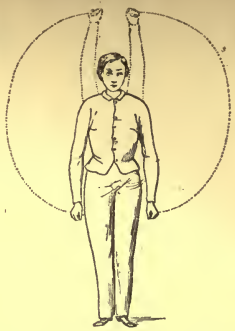
should be some falling off, they can remedy it before complete failure sets in, and thus to the end of life the powers will be preserved in all their fullness. Physicians and wise laymen will recognise that in the suitable use of these exercises, i. e., by making such use of them as the individual powers permit, they may be made a most natural and simple means for regulating the clockwork of our physical life, as well as a fountain of health flowing widely for those who will use it.

Head-circling.

2) Head-turning.

3) Shoulder-raising.

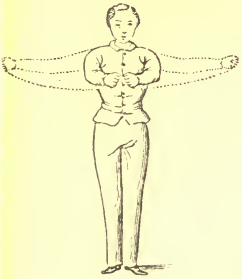
4) Arm-circling.



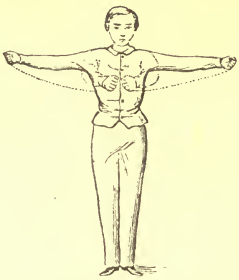
5) Arm-raising from the sides outwards.

6) Elbows backwards.

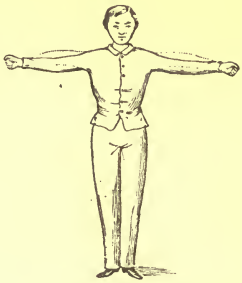
7) Ha



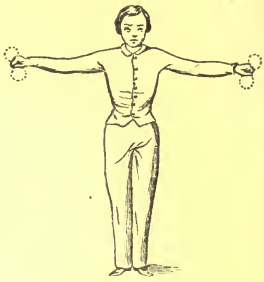
14) Bringing the arms together.



15) Throwing the arms outwards.

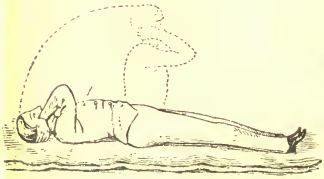


16) Arm-twisting.

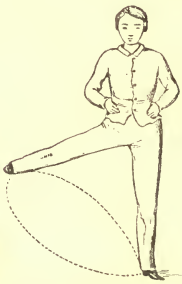


17) Figure of 8 movement with the hands.

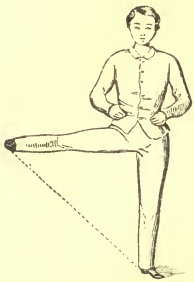
18



24) Raising the body.



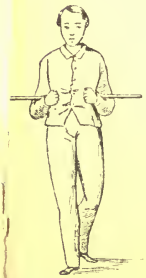
25) Leg-circling.



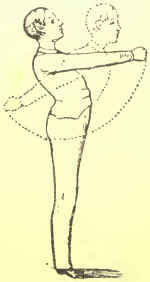
26) Leg-raising sideways.

27) Leg-twisting.

28) Drawing legs togeth

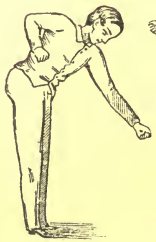


35) Walking with transfixed wand.

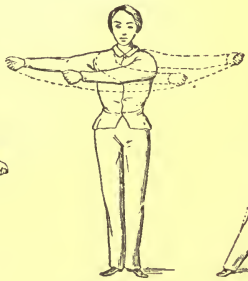


36) Swinging the arms forwards and backwards,

37) Armswinging sideways.



38) Sawing-movement.



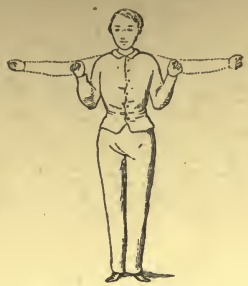
39) Mowing-movement.

40) Hew movem

clasped
nd.

8) Unequal deep breathing.

9) Striking forwards.



10) Striking sideways.

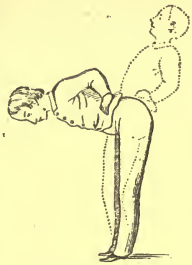
11) Striking upwards.

12) Striking downwards.

13) Striking backwards.

ger-bending and stretching.

19) Hand-rubbing.



20) Body-bending forwards and backwards.

21) Body-bending sideways.

22) Body-turning.

23) Body-circling.

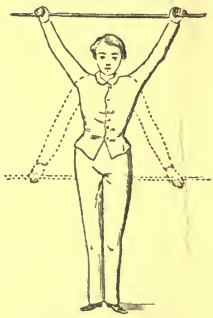
29) Knee-stretching and bending forwards.

30) Knee-stretching and bending backwards.

31) Foot-stretching and bending.

32) Knee-raising forwards.

33) Settling down.



34) Wand-circling.

41) Trotting-movement on the same base.

42) Leg-waving forwards and backwards.

43) Leg-waving sideways.

44) Stepping over a stick.

45) Rolling on the back.

Table of Diagrams for the Prescriptions of the Fifth Part.

THE diagrams in the annexed table are drawn for convenience in reduced proportions and more in outline. They are only intended to assist the memory, while the exercises recommended in the fifth part are gradually learnt by constant practice.

If it should be desired to learn some of the details of them more thoroughly, the page where the full description, both by illustration and letterpress, of each exercise has been given in the fourth part, will be found in the following index: